

TPM Volume-7

Total Preventive Maintenance

SEISO in Jishu-Hozen (final lecture)

2019a Edition

Koichi Kimura



Factory Management Institute

COOPERATING TO REACH EXCELLENCE



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Icons:



Notes: Going and Comeback to the main theme.



Third level of the Issue, in order to provide more clearness to the structure of the text.



Lower levels of the Issue, commonly 6th or 7th And, pointing out necessary explanations about pictures or graphs.

UPDATING TABLE:

Date, Version-Previous & V-Next	Chapter (I..XX...)	Chapter Point.- sub-point : (Updating)
June 2019 to June 2019a	IX. One lecture in a company. 31	JIPM TPM Chesklist edited in table and translated into Spanish also.

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I. Introduction

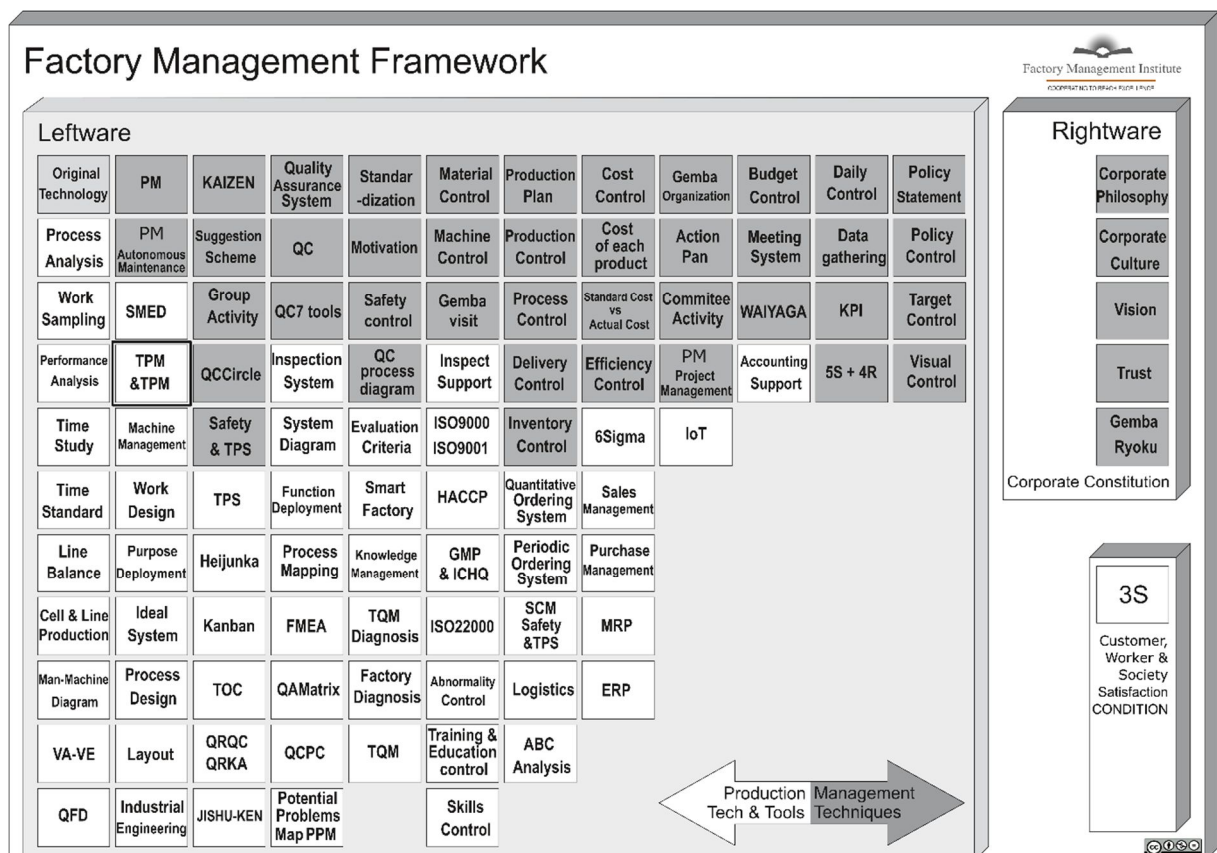
In TPM-6 I wrote the mind-set of Maintenance Seiso activity as next:

The attitude of Inspection Seiso.

1. *Operator himself needs to dirt his hands and make Seiso.
Even though it lacks the manpower, it must be never to consign Seiso to (for instance) outsourcing and must make Seiso by operators themselves.*
2. *Cleaning up all of many years dirty.*
3. *Try to open lids and cover which haven't been checked and to clean up thoroughly.*
4. *Make Seiso not only the body, but also incidental equipment such transport equipment, measuring instrument, electrical equipment, inside of oil tank.*
5. *Not give up just because of soon getting dirty and to investigate from where, how getting dirt in time and why getting dirt.*
6. *This investigation is used for the countermeasure of prevention of scattering dirt. (I will describe this theme next.)*

These points are important to implement Seiso activity.

On the other hand, the management participation also important as the inseparable relation.



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II. Control TPM activity

Management is required to control Gemba activity. I describe this theme in TPM control exactly latter. But shortly I describe this in this Seiso in **Jishu Hozen**. So, management is required to provide next items (1..4):



1. TPM control board and visualizing

Example of TPM activity control Board on the right.

And the contents of visualized information are:

- a) Regular maintenance schedule.
- b) Maintenance Seiso Group and suggestion cards result.
- c) Machine performance indexes results.

Above photos are TPM control board and introducing Kaizen activity relating TPM.

Right hand side is the information of a Kaizen group.

Left hand side is the information of total Kaizen circle control board.



Then, if you wish to implement TPM, it is one of essential item to provide such control and information board.

TPM Activity Example (TPM Kaizen Sheet)





2. Decide KPIs (Machine performance indexes from TPM-2¹)

Delivery Time Observance Rate (DTO rate).

- $\text{DTO rate} = (\text{Actual Output} \div \text{Planned Output}) \times 100$
- $\text{Hourly Output} = (\sum \text{Actual Output} \div \text{Machine working Hour})$

Machine Performance rate.

1. Machine Performance Rate ($= \sum \text{Operative Hours} \div 20\text{days} \times 8\text{hours} \times 2\text{ shifts}$)
2. Machine Operation Rate ($= \sum \text{Operative Hours} \div \sum \text{Planned Hours}$)
3. Machine Performance with Speed Rate ($= \sum \text{Number} \times \text{T/E: Speed} \div \sum \text{Planned Hours}$)
4. Breakdown Rate ($= \sum \text{Machine stop Hours in Breakdown} \div \sum \text{Planned Hours}$)
5. Machine stop frequency Index ($= \sum \text{Number of Machine stop frequency} \div \sum \text{Planned Hours}$)
6. Changeover Time ($= \sum \text{Changeover Time} \div \sum \text{Number of Changeover}$)

BREACKDOWN MACHINE MAP 2006-2008 MACHINE DYE 1512

Hidraulic engine
system
9 failures registered

Spindles
2 failures registered

Cab 1
1 failure registered

X Axis
1 failure registered



Speed Control of
Cab 2
7 failures registered

CNC
4 failures registered

Cab 3
1 failure registered

Z Axis
1 failure registered

Above picture is a main machine trouble map which is visualized the past trouble in the TPM control board. And it was used for their TPM activity. It is also is good idea to share the information with operators. In fact, such visual information board is very primitive in the age of IoT and AI. However, the primitive tool is essential for Gemba management.



3. Target (to KPIs) and action plan.

... (omitted)

¹ TPM-2: <https://archive.org/details/TPM2MudaInMachineryRelatedInGemba>



4. Follow up the result of action plan.

Anyway, it is necessary to make manage in Gemba. And now, it is the age of AI and IoT. In this environment it is necessary to use AI and IoT tools in management.



Flying notes by Sensei Kimura

Digestion about using AI and IoT

By the way, I have written the problem of computer keeper manager. And for such manager who doesn't make Gemba walk, there are good news and bad news.

The good news is “He can gain any necessary data with using sensor, surveillance camera and AI very quickly and almost at same time”.

Abnormalities of noise, smell, vibration, heat, colour, leaking in machine are identified and recorded and analysed with sensor and camera with a will.

Abnormal movements such unsafe behaviour and unnecessary movement of employees are also recognized with AI camera.

And, not only gathering data but also analysing it and showing the countermeasures. Therefore, he can be in his office and can command from office.

Although, the bad news is “He will be replaced to AI”. And he will be replaced by AI commander and lose the position of a manager. I don't want to threaten managers. But please be careful. Such age is coming very soon. As I write latter, Gemba is a very creative and is a Dojo to cultivate a sensitiveness.

My warnings are that Technology is developing very rapidly which we haven't experienced before. In Japan there is the word which mentions the rapid development as next: 科学の進歩は日進月歩だ。 *Kagaku no shinpo wa nisshingeppoda*

- 科学: Kagaku, **science**.
- 進歩: Sinpo, **development or progress**.
- 日進月歩: NissinGeppo, **progressing daily and monthly**.

When 20th century, still this word was alive. However now the development speed is:

- 秒進分歩だ: ByouShin FunPo: **progressing by second and minute**.

Anyway, I feel the fear of the progressing speed. And, Why I feel so?... In one theory, the birth of humanity is 7million years ago. And mankind developed very slowly which it was sufficient speed a mankind to adopt new environment.

Up to 20th century, mankind could adopt to the new environment. But now, the development speed seems to shake off the adoption of mankind.

Another one of waning is Mankind never compete to AI capacity, but use it.

Yesterday I saw a documentary news which says that 50% of current jobs in Japan might be replaced to AI and Robot. Also, last month (Oct. 2018) I saw the USA news which told and showed a worker's demonstration in a street. They appealed their wish which never confiscate their job in the circumstance of AI development.

It is often said that there is classification of rich, middle and poor. However additional class shall occur which is unnecessary class who cannot adopt to the rapid stream of AI era.

Now, how a mankind can be in the side of using AI?... The answer is simple. Mankind needs to do the thing which AI cannot do.

The thing which AI cannot do?... It is creative thinking. And the base of it is sensitiveness.

Gemba people is happy. Because Gemba is active and always changing: 静と動

- 静: sei, **stillness**.
- 動: dou, **motion**.

And, **Office Gemba** is Sei (**stillness**) and **Production Gemba** is Dou (**motion**).

Production Gemba people is happy, because they can touch machine, tool, products and can have the opportunity to feel normality and abnormal happenings. And they can rest in the comfortable area which are such well provided rest area, canteen and toilet.

Computer keeper manager is happy, because can be in the Sei area always with the compensation of losing the opportunity of cultivating sensitivity and intuition.

A machine operator is happy, because he can touch it and listen its condition. And sometimes he can do a game which is maintenance Seiso and compete the number of Kaizen suggestion (Red and blue cards).

Gemba is a Dojo (Training field). And, manager is happy, because he can use this Dojo to sharpen his sensitivity and intuition. But he needs to pay the compensation which is to wash his hand 10 times in a day.

Please think business in Gemba and generate idea in Gemba and wash your hand 10times a day. These visual boards and information are also your thinking tools.

Even though AI is improved, machine, device, equipment which are made by human break down and/or going wrong. A sensor also breaks down and to go wrong and becomes a cause of a large number of defects.

Anyway, for the success of Jishu-Hozen, the combination of Gemba and management is essential.

Please understand that in a decade production Gemba including Maintenance environment shall change very dramatically. And the dramatic change speed is very rapid with the evolution of AI and robot. However, the important thing is to know the base of TPM and one sensitivity to use AI (IoT) and robot correctly and safely.

III. Inspection points in Maintenance Seiso.



- 1) To search not only the visible defects, but also rattle of installation, vibration, fever which are possible to find them with touching by hand.
- 2) To keep a watchful eye on the problems of relating to functional trouble such wears of pulleys and belts, foreign substances of sliding surface, clogging of suction filter.
- 3) To investigate the points of easiness of Seiso, oiling and checking and cover which is large and disturb the maintenance job and the position of oiler which is malfunctioned and mal-workability.
- 4) To check the function of meters which should mention the standards.
- 5) To investigate the sources of oil leakage and air leakage.

And, it is necessary to cultivate the eyes of investigation abnormality as abnormality in having a lot of experiences. In that way I repeatedly tell you that **“Any equipment, devices, sensors which are made by human breaks in even AI era... Beware”**.

Now in here I describe some examples of inspection Seiso...



Example-1: Hydraulic unit.

1) Visual check

- No dirt of hydraulic unit with chips and cutting oil.
- No oil leakage from pump, solenoid valve and joint etc.
- Pressure gauge to be appropriate and indicate correct figure.
- Model of pump and motor and the capacity to be appropriate.
- Oil level gauge to be visible clearly.
- Colour of oil and the quantity to be appropriate.
- The cap of oil filler port to be closed.
- Not gaps or holes that allow dust to enter each part of the tank body.
- Not to return the leaked oil directly to the tank

2) Listening.

- No generating beating sounds of pumps, motors, solenoid valves, piping systems etc.

3) Touching surface.

- No fever and vibration of pump, motor and solenoid valve.
- No looseness of locknuts of pump, motor and solenoid valve etc.
- To confirm oil leakage with wiping the point.
- No contact and cross of piping (concern of breaking in ware.)

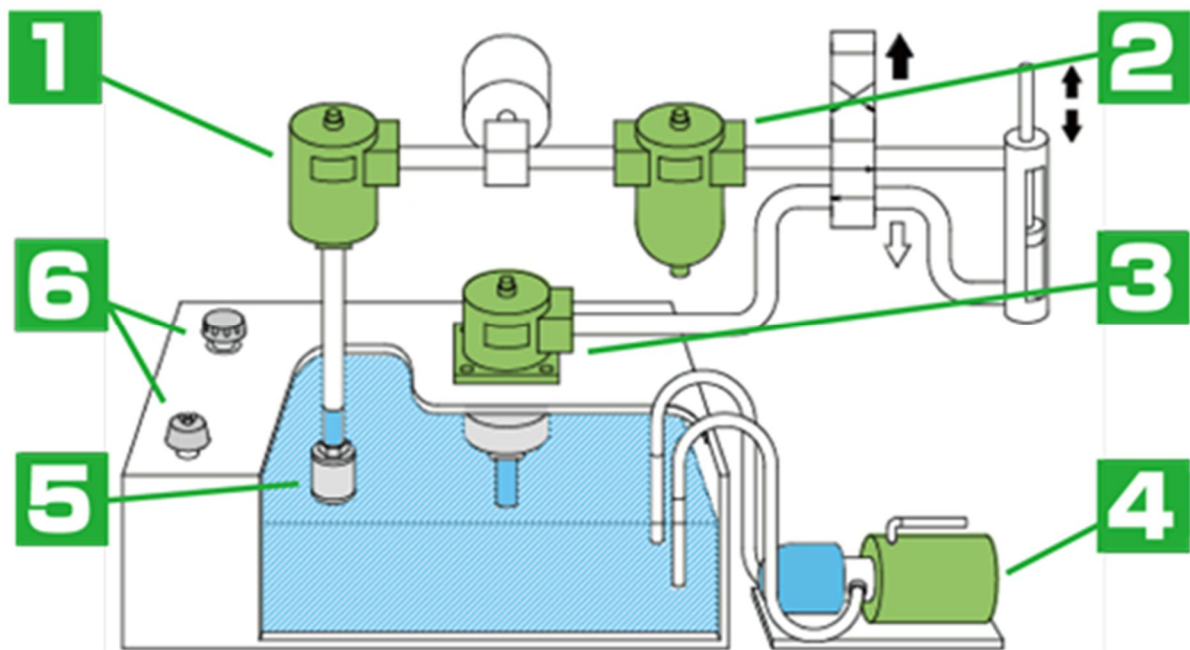
4) Checking with removing and detaching.

- Checking the wear condition of motor and coupling of pump.
- Checking the condition of air breather of oil filler cap.
- No break and dust of oil filter of oil filler point.
- No accumulated dust & chips inside the tank.
- Checking the clogging of suction filter.

By the way hydraulic filter.

I would recommend to make filter control. Because it is the points which are easy to overlook in machine maintenance. Therefore, I recommend to use the visual control for filter control.

Role and type of hydraulic filter. So, please look at next picture.



For instance, in this picture oil filters are used in 6 points. These are from 1 to 6 and they are the Suction line filter, the Inline filter, the Return line filter, the Offline filter, the Suction strainer and the Breather.

In the oil circuit of the hydraulic system, dust will occur in all places such as breather, tank, pump etc. Therefore, by installing multiple filters according to each place, the circuit is protected. Then you need to grasp the type and role and to attach an appropriate filter to the machine.

Let's look at the filters one by one...

- 1) **Suction line filter:** It is a filter installed on the line heading from the reservoir tank to the pump. By installing before the pump, it prevents contamination of the pump and protects it. And the filter has various materials and shapes.
- 2) **Inline filter:** It is a filter installed on the discharge side of the pump. By installing in the line (delivery circuit) heading from the pump to the operation part, clean up the oil before operation and protect the operating part such as the control valve and the cylinder. There is also a last chance filter etc. installed just before the equipment to be protected.

- 3) **Return line filter:** It is a filter installed on the line returning from the operation part to the reservoir tank. Remove dust generated by hydraulic components and foreign dust from cylinder lots to prevent dust from entering the tank.
- 4) **Offline filter:** It is an independent filter with a pump motor installed outside the hydraulic circuit. Remove dust in the tank. And it is used if there are concern of insufficient cleaning on the line, and of to be difficult to install a filter on the line.
- 5) **Suction strainer:** It is a filter installed in the suction port of the pump in the reservoir tank. It prevents inhalation of dust in the tank and protects the pump. In order to prevent cavitation, it is characterized with a relatively coarse filter such as wire mesh made.
- 6) **Breather:** Install in the air hole (air breather) of the reservoir tank or the filler opening (breather filler opening). It is a role to prevent external dust, dirt, foreign matter, etc. from coming into the tank at the time of suction and exhaustion and oil supply. There are also types that are shared.

Various types of filter.

Various types of filter are used in a hydraulic unit. Because the passage through which the hydraulic pump draws in hydraulic fluid is called a suction line.

If dust is contaminated in the hydraulic oil coming in from here, the hydraulic pump may have various trouble phenomena.

Suction filter (also called suction strainer) is installed so as not to inhale dust. However, only the suction filter cannot protect hydraulic pumps or hydraulic equipment. With only the suction filter used for the suction line of the hydraulic pump, it is impossible to completely remove the dust in the hydraulic oil.

This is because suction filters for protecting hydraulic pumps are generally large in mesh size to trash garbage. Since its size is about 1/10 mm (100 microns), smaller trash and dust can easily pass through the suction filter into the hydraulic pump.

If hard trash like the metal powder and dust in the hydraulic oil bites to the metal sliding part in the hydraulic pump, the hydraulic pump will break by burning.

The suction filter aims to capture relatively large dust (about 100 microns or more) in hydraulic fluid so that the hydraulic pump will not be broken suddenly.

In here, questions will arise as to why the mesh of the suction filter's net is not made fine.

The reason for this question is that the hydraulic pump will not be able to inhale oil. By making the suction filter's mesh small, the suction resistance of the hydraulic pump increases and this time the cavitation phenomenon leads to destruction of the hydraulic pump. Also, if making the mesh of the suction filter finer and making the suction filter large, this time it needs a huge build and it cannot be economical.

Small trash & dust that passes through the suction filter and enters the hydraulic pump gradually reduces the function of the hydraulic pump even if it does not cause a sudden accident. That is because the well-known wear phenomenon occurs in the hydraulic pump as follows.

- (1) Adhesion wear
- (2) Rough (Sandstone) wear
- (3) Erosion wear

The suction strainer installed in front of the hydraulic pump is certainly effective for preventing sudden destruction of the hydraulic pump. But unless all of the filters making up the hydraulic system is healthy; it cannot fulfil the expected function.

Therefore, keeping the hydraulic oil circulating throughout the hydraulic system shown in the figure constantly in a clean state is a prerequisite for the hydraulic system.

Example-2 Drive part.

1) Visual check

- No dirt of the motor and speed reducer with chips or cutting oil.
- Belt not swinging. The tension to be normal.
- Oil level gauge of speed reducer gear to be easy to look.
- Safety cover to make it easy to inspect belts and pulleys.

2) Listening.

- No buzzing noise, slip noise, etc. from motors, speed reducers, belts, chains, etc.

3) Touching in driving.

- No vibration, no heat generation of motors, speed reducers, etc.

4) Looking or touching in machine stopped.

- How about the colour and quantity of the oil of speed reducer.
- Safety cover to be fixed tightly.
- No looseness of bolts of motor and speed reducer.

5) Take off and confirm

- Tension of belt.
- The type and number of belts and pulley.
- No wear in belt and pulley.
- No rattle of bolt and key of pulley.
- No hang on diagonal of belt between pulleys.
- No misalignment between motor and speed reducer.
- Wear situation of coupling of motor and speed reducer.
- No dust in cooling fan of motor.
- No chips and dust in lubricant of speed reducer.

Tea break...

(No necessary to read because of no relation to TPM)

When writing this TPM-7 in Nov. 2018, a news program reported an incident. Which is the arrest of Mr. Carlos Ghosn (President and CEO of Nissan, Renault and Mitsubishi alliance). And the news is still running around the world. This arrest dram with money scandal is most sensational news so far in recent year. And the details have become clear day by day.

When reading some newspapers, a maxim of Arthur Schopenhauer² suddenly came to mind.

The maxim says that:

The more drinking Sea water (Comparing wealth to sea water.), the more getting thirstiness.

It is not necessarily because of poverty that people desire wealth.

Precisely because to be rich, there are people who still crave.

And, a famous song suddenly came to mind. It is the song of ABBA and is

"Money, money, money, it a rich man's word".

Abba³

Mr. Carlos Ghosn. He is a rich man (we believe that he has sufficient money for the life.). But still he craves money.

And, when looking at this news again a passage of the sentence of Machiavelli's "The Prince" suddenly came to mind. And Machiavelli said that:

"Non-moral acts are also allowed. However, for better governance"

This word said very openly how to be a leader.

He was appointed the position of Nissan CEO in 1999. And in a few years, he restored the management crisis with very dramatic acts including more than 20thousands workers cut and restructuring. I think it is a Machiavellianism.

A leader sometimes misunderstands this word.

² **Arthur Schopenhauer:** 22 February 1788 – 21 September 1860) was a German philosopher. He is best known for his 1818 work *The World as Will and Representation* (expanded in 1844), wherein he characterizes the phenomenal world as the product of a blind and insatiable metaphysical will. Proceeding from the transcendental idealism of Immanuel Kant, Schopenhauer developed an atheistic metaphysical and ethical system that has been described as an exemplary manifestation of philosophical pessimism, rejecting the contemporaneous post-Kantian philosophies of German idealism. Schopenhauer was among the first thinkers in Western philosophy to share and affirm significant tenets of Eastern philosophy (e.g., asceticism, the world-as-appearance), having initially arrived at similar conclusions as the result of his own philosophical work.

https://en.wikipedia.org/wiki/Arthur_Schopenhauer

³ **Abba - Money, Money, Money:** <https://www.youtube.com/watch?v=ETxmCCsMoD0>

This word never say that any non-moral acts are allowed for a man of power, but say for better governance.

And Machiavelli says that

“When a monarch conquering other country, it is necessary to carry out the necessary drastic measures at a stretch”.

And the situation of Nissan crisis was a time of Life-and-death matter. Therefore, his leadership was accepted by all. But another opinion also there in Japan.

When looking this money scandal, the names of 2 Japanese managements suddenly came to my mind. One is **Konosuke Matsushita** (the founder of Panasonic) and **Kiichiro Toyoda** (the founder of Toyota).

Konosuke Matsushita recollected and answered to an interviewer what was his most painful managerial decision as follow.

At early Showa era his company fell in the managerial crisis, because of the economic panic. And he was compelled to cut and reduce half number of employees. But he considered method to evade the layoff.

Then he decided to do half day working and half wages.

And as one result nobody was dismissed. And he could overcome the crisis. But as the result this company could establish the good relationship between company and employees.

The case of **Kiichiro Toyoda**: At 1949 Toyota was compelled to dismiss employees, because of the managerial crisis in the economic crisis. Then he conducted the dismissal. But he also opted out from the position of president manfully.

By Japanese, an image of great management is like above 2 persons and not the image of Mr. Carlos Ghosn who made the drastic restructuring.

I never judge which is better. Because the managerial judgement must obey the circumstance of the time. However, as a Japanese culture, Japanese cannot follow the Machiavellianism. And Japanese considers to reduce the pain even though it is understood that the reduced shock and pain will continue longer.

But it is also true that Machiavellianism is right in the circumstance of Life-and-death. And the act of Mr. Carlos Ghosn was correct in a few years. But after the period of Life-and-Death (Managerial crisis) he shouldn't be the position of CEO.

A Japanese management is extreme clumsiness in the circumstance of Life-and-Death.

In the previous description I wrote the regard of strategy. I think that a strategy is the vector of quality of the strategy and speed. A Japanese management has the lack of in "speed". And also, Japanese has a trend of avoiding a decision involving many sacrifices.

And this is Japanese who is neither good nor bad.

Westerner's trend is to take a rationalistic decision of involving many sacrifices or not.

Mr. Carlos Ghosn or his type of leadership is for just in the circumstance of Life-and-Death. And the way of Machiavellianism is not suitable after overcoming the crisis.

With this arrest, general Nissan people felt resented that (if the suspicions are true things), the biggest Muda was his personally used company's money. Because he was called "Cost cutter".

A newspaper introduced the voices of French people. There are opinions of Nissan's Coup d'etat and conspiracy. And a Japanese voice said that it is one page of supremacy battle between Nissan and Renault.

When reading this, one thing suddenly came to my mind... Mr. Carlos Ghosn, I believed him to be a **Tatsujin**⁴ of management. But unfortunately, he was arrested with the suspicion of foolish thing which is a criminal offence of top manager of non-famous and ordinal small company to fall down. (Of course, the scale is different.)

He might be one **Tatsujin** of management. I believed so. But he laid himself open to attack. And he was fired from the position of Nissan. I don't know the authenticity. However, it is quite true that he was "off guard and carelessness".

Is he fool? Because he laid himself open to attack.

If the suspicions which he used company's money for his private issues such his gorgeous wedding in Palais de Versailles or expensive family trip etc. is true, such things are never accepted as a part of company's welfare (even though in his position).

Probably he was in "off guard and self-conceited".

In a famous art of war book of Samurai, there is a precept. And it admonishes the "off guard and self-conceited (arrogance)". And, in the culture of Samurai, there are both side views.

One is to attack from back is cowardice and another one is that "If a Samurai has a wound made by cut in back, he is scorned because of to be unguarded (off guard)".

It was often said that a **Tatsujin** of sword has (or must have) eyes on his back too. And it is admonished not to be "off-guard and self-conceited".

Off-guard and self-conceited is the correlation.

Off-guard calls self-conceited, and Self-conceited calls off-guard.

Anyway, this charisma management' political life in Japan is finished, no matter how the result of the trial will be.

Charisma? ...When Mr. Carlos Ghosn was arrested, some newspapers reported it with the title of "Arrest of charisma management".

And, when reading this news and the title, a name of a person came to my mind. Who is Karl Emil Maximilian Weber? And he was a person who used the word charisma firstly in his paper.

⁴ **Tatsujin (達人)**: is a Japanese concept representing a fully self-actualized human being, or a complete person. It is a higher state of consciousness, that is uninhibited by the weaknesses in our personality that make us inherently human. <https://www.wordsense.eu/tatsujin/>

Mr. Carlos Ghosn was called Charisma management.

Maximilian Weber⁵ recites that there are 3 elements to justify a governance. These are "historical justify, charismatic and legality".

Mr. Carlos Ghosn was called Charisma. And, Maximilian Weber defined that Charisma is extraordinary genius nature. And the driving force of governance is different to other 2 (historical justify and legality), and is people's intrinsic motive (a feeling to let's follow this charisma person.).

The people pay attention his all movements and his words and understand the direction and act hard. The governance of charisma leader has strong effect. However, on the other hand this has the risk which it falls into high-handed (domineering, despotic).

Legality

In short, Legality is the system based on the rule and penalty (if deviates from the provision.). But as you understand, it is not possible to make excellent governance by only it. Many rules are made in company and society. And it is required to obey the compliance with the law. But in the society, there are 2 norms: One is law, and another is moral. A society cannot be supported with just law, and needs moral.

In the world unfortunately there are people who seek the law loopholes for their personnel profit even though the acts are unmoral.

Again? This again? ...Nissan's cheating act of car final inspection.

Still Mr Carlos Ghosn's money scandal is been reporting in the newspaper daily. And in the meantime, additional dishonoured news was reported. It is the cheating act in the inspection process.

Again, and again? ...In reality, it is second time in the Ghosn's regime. And the newspaper titled "**Evil of Ghosn's regime**".

A Nissan top management replayed to the interview:

"It is necessary to recognize the negative aspects of Ghosn's reform".

Also, he answered to the question which: Is this the final with this cheating inspection?

"It is painful to answer for me. But I believe that we brought out into the open all the negative side that has been poisoning Nissan".

When reading his interview, I felt that the top managements including him are cowardice.

⁵ **Max Weber:** (21 April 1864 – 14 June 1920) was a German sociologist, philosopher, jurist, and political economist. His ideas profoundly influenced social theory and social research. Weber is often cited, with Émile Durkheim and Karl Marx, as among the three founders of sociology. Weber was a key proponent of methodological anti-positivism, arguing for the study of social action through interpretive (rather than purely empiricist) means, based on understanding the purpose and meaning that individuals attach to their own actions. Unlike Durkheim, he did not believe in mono-causality and rather proposed that for any outcome there can be multiple causes. https://en.wikipedia.org/wiki/Max_Weber

In reality, Mr. C. Ghosn grasped the full authority which is to include to hold the personnel rights and compensation determination rights of all 53 executive officers including president Saikawa. Also, he grasped the full authority of board of directors and the executive committee. It is substantially dictatorship.

I understand such background. However, still I feel them (top managements) to be cowardice. If they are Samurais, they should do "Seppuku (Harakiri)" and resign with taking the responsibility even though they were under dictatorship regime. (I never say to suicide, but to take sever responsibility.)

Rationalism and inspection process

I believe Mr. C. Ghosn never said the "cost cutting" of inspection process. However just he required clear commitment to achieve the cost reduction amount. And he never evaluates the process, but just to require the commitment of cost reduction amount.

Because the consideration of the process of cost cut is not his matter and the individual managers'. However, and unfortunately, perhaps his rationalism penetrated deeply.

There is a side of which in conflict between rationalism and inspection. Because An inspection is Muda in the definition which "No giving any added value to a product".

Yes. An inspection is Muda. But as you understand it is "necessary Muda". There are many such necessary Muda in factory. Of course, there also the targets of cost reduction with good alternative ideas (with avoiding the quality of Muda). Therefore, the coach namely rationalism must have a brake which is so called morals.

I'm not a legal expert. Therefore, I cannot judge his behaviour in Nissan to be legal or not. But it is clear that his behaviours to be immoral.

His management style is the rationalism based on Machiavellianism and was accepted most of the people because of the corporate situation (Life-and-Death) and the reliability to him. But, unfortunately, all Japanese people felt that reliability to him was betrayed with his immoral behaviour. Because, his rationalistic and drastic management such many people layoff for cost cutting was supported by their sacrifice & pain.

Mr. Carlos Ghosn let subsidiaries of Nissan buy villas in several countries and used for not only his business bet also for the travels of his family.

In Western countries, taking family in business trip and use corporate facilities might be legal. However, his behaviour is felt immoral in these countries also.

I wrote above that Mr. Carlos Ghosn's political life as a great management in Japan is finished (even though his innocence is proved legally.).

He expressed good word in an interview:

"Who should be most severe person for one's own self? ...It must be one's own self".

Good word. But he didn't do so.

Now tea break is finished. And, we go back to original theme.

IV. Inspection Evaluation and Cards Activity

In TPM-3⁶ and other, I described the Putting cards activity as next.

And again, I write the points of the cards activity.

- 1) The defect found by Inspection Seiso is basically to repair it by operators themselves.
- 2) For each defect, think about the form that the machine should be.
- 3) Do not miss any small defects, consider what it will give the influences and think again from the principle and repair it.
- 4) Understand the instruction manual well. (One reading is insufficient, five times should be read.)

For ***maintenance Seiso***, the operators get dirty their hands, devise and think, experience repairs which have never been done. Then they will know the hardship of the maintenance engineers and understand the source of the dirt and the true character. Through this activity, they will have a solidarity as a person engaged in the same machine. As you usually feel the sense of guilty conscience to what they thought of nothing as they are, do not want to cause such things to happen by repairing with difficulty.



V. Skill Evaluation and Control

As you understand it is not the end with just putting cards. It is necessary to make countermeasures. And one of rule is that the problems found should be repaired by themselves. However, it is difficult to judge which problem or how degree of problem should be repaired by themselves. If difficult problem also is left to repair to them, it might become the cause of other problem.

Then the skill evaluation and control become important.

⁶ TPM-3 & 4: TPM-3 & 4: <https://archive.org/details/TPM3MantenimientoPreventivo>
<https://archive.org/details/TPM3PreventiveMaintenance>

TPM-4: <https://archive.org/details/TPM4JishuHozenesp> <https://archive.org/details/TPM4JishuHozen>

Inspection Seiso, finding abnormalities with 6 senses (not 5 senses, but 6), putting cards and repair them. This series shouldn't be left to just AI and sensors even though these are improved remarkably.

Human resources should have the role in cooperation with maintenance department for the skill evaluation & control.

Maintenance department role:

1. List up of essential points of inspection & degree of difficulty (in 1,3,5 ranking method).
2. Training and teaching.
3. Evaluation.

Human resources role:

1. Making the system of training & education & evaluation.
2. Receiving information and recording. And change & abolition.
3. Disclose information officially.
4. Incentive in salary.

In that way, HR important job role is to secure the fairness.

VI. Concrete example of Kaizen

In the company, the putting cards activity in Maintenance Seiso was started with next conversation.

—Unfortunately, our group couldn't finish the card activity last time. Therefore, we need to start from around the cutting feed cylinder.

—By the way, it is said that there is an oil leaks from cutting cylinder. Then let's check it out firstly. And, OK, in this way we recognized the abnormality.

Let's write the abnormality in a card

Phenomenon of defect

Oil leaks from the rod of the cutting feed cylinder of the hydraulic lathe every time when the cylinder is activated.

But before entering into the matter, I have to say that, the activity of "Putting cards and taking off" is not just make record, but also required to consider the root causes like 5Whys.

And each item of 5Whys is recorded in the list. In the case of the company which I have lessened, from one card abnormality recorded, many other relevant additional Kaizen suggestion were created. The next is the example.

Again...

Phenomenon of defect: Oil leaks from the cutting feed cylinder.

1. How about the movement?
 - a. No problem. But oil leaks.
 - b. Let's break down the part. Then...
2. The cause of leaks?
 - a. Cut of O-ring.
 - b. Putting card and Countermeasure: change the O-ring.
3. Why O-ring cut?
 - a. There is a scar in the rod.
 - b. Putting card and Countermeasure: Maintain the scar of rod.
4. Why is rod hurt?
 - a. Chips coming on the rod and adhered on it.
 - b. And/or rod biting small chips which are in oil.
 - c. Putting cards and Countermeasure: Let's make countermeasures for both potential causes.
 - d. And firstly, Biting chips
 - e. Card and countermeasure: Devise of "Prevention of scattering". (Prevention of scattering is written in next chapter.)
 - f. Secondly Small chips in oil.
 - g. Card and countermeasure: Drain the oil and Seiso. And serve clean oil.
5. Why are small chips in oil or why does oil dirty?
 - a. Small chips scattering and also small gap in the tank and rid.
 - b. Putting card and Countermeasure: Repair and close the gap.
 - c. Countermeasure of scattering chips: Same to above. Devise of "Prevention of scattering".

—OK. Let's try to move machine but still there are small bad movement and slow movement.

1. Why slow and bad movement?
 - a. Cause: Clogging of strainer.
 - b. Putting card and Countermeasure: Seiso of the strainer.
2. Why strainer clogged?
 - a. Cause: Oil to be dirty.
 - b. Putting card and Countermeasure: Drain oil and Seiso. And clean oil.
3. Why Oil to become dirty?
 - a. Cause: Dirt & chips getting into tank.
 - b. Putting card and Countermeasure: Prevention of scattering of chips & lubricant.

Tea break by digression

When writing this description, a TV news reported an interesting article which is AI support daily cooking. Next is the dialogue with my wife.

—It is indeed that this AI is very convenient —said my wife—. I always struggle to decide the menu of evening meal. It is necessary to consider with the stock in refrigerator. It is indeed troublesome.

—I agree and suppose that it is troublesome and difficult —I said—. No, it is not difficult. However. I think this thinking is very creative —and I continued.

—Firstly, you need to decide the menu with considering the nutrition balance, volume and possibility with the material stock. Sometimes you need to consider the menu in reduction or avoiding Muda of materials. This is indeed creative work —I concluded.

—Creative? Is it true? —asked me my wife.

—Of course, yes. And a housekeeper does every day.

—This AI with smartphone helps to consider the menu and also tells the recipe. Shall I download and use the application software? —asked me my wife.

—MMMMM —I doubted—. I suggest you no to use it.

—Why not?

The history of human ancestry seems to go back to 400 thousand years ago. And, one theory says that a human's capacity (function) retrograded.

For instance, ancient people had much better eyes, ears and nose like as animal. Particularly 5 senses were much sharper than ours, modern people.

Fortunately, at present day we don't know a suffering of hunger and can enjoy a convenient life, in most area, with the civilization development. However, in exchange for the development of civilization, we retrograded fundamental capacity.

Recently the team of Tokyo University and California Institute of Technology announced very interesting research result (2019. Mar. 19).

That team found the existence of the unconscious potential ability that can be called "sixth sense" of human. And it is "magnetic sense" and to feel the geomagnetism.

As you know, the earth is a huge magnet which is the S pole at the North Pole and the N pole at the South Pole in it, and is geomagnetism with different directions depending on the position. The migratory birds use their ability to sense the magnetic field like a compass to grasp the direction accurately and move according to the season. And, the senses of human beings were thought only the five senses of sight, hearing, touch, taste, and sense of smell.

The research team conducted an experiment in which the heads of 34 men and women aged 18 to 68 (Japanese and the United States), were stimulated with magnetism of the same strength as the geomagnetism in a room where the geomagnetism was shut off.

As a result, it was judged that human beings have the ability to roughly sense the geomagnetism because the brain waves showed different responses unconsciously according to the direction of the magnetism.

"Magnetic sense" that feels the geomagnetism is possessed by many animals such as salmon and honeybees as well as migrating birds, and humans are believed to have been retrograded before.

However, the human body has a lot of minerals and proteins that are thought to work to sense magnetism, so it seems that the power to feel was left even though it could not be used. And, it is one kind of disuse atrophy.

This news showed the existence of No. 6 sense (magnetic sense). However, I believe human being has other No. 6 senses.

For instance, a master swordsman such Musashi Miyamoto could feel a murder in the air in his back. Such feeling sign is unconsciousness and might be one kind of 6 sense. For instance. One specialist can feel something strange when he comes in to his factory when there is some abnormality.

Now, the development of AI is remarkable. Although, in the other hand this progress accelerates the human retrograde.

I'm afraid that the AI aid (help of thinking menu) accelerate retrograding the daily creative activity (thinking a menu of meal and creating).

Civilization is developing. But unfortunately, it accelerates to retrograde the general people's function in right brain (power of idea creation). And the appearance of AI affects to injure such creative life.

Please don't misunderstand. I never say to defeat to civilization, but use conveniently with the human thinking which the articles human made is never perfect and makes mistake.

Production Gemba.

The Production Gemba is alive. And, it is a creative field. In that way Machine maintenance is also one creative field.

We need to use AI & sensors and IoT conveniently. But we should never be defenceless and carelessness. Because whether AI, sensor or IoT, there were made by human. Therefore, it is quite natural to break or to become defective.

Then, I suggest not to leave all to such convenient tools. But please, sharpen 6senses to identify abnormality by your primitive sense. For sharpening senses, the education & training is essential.

When writing this again very serious and tremendous accident was reported in Japan. This accident was not only in Japan, but also happened in other 11 countries.

2018. Dec.06. Suddenly internet communication failure occurred in mobile phone. And this influence affected about 40million mobile phone users. During 4hours, this influence affected to (for instance) delivery trader, emergency service such ambulance and fire engine and mobile phone pay and admission ticket.

Same trouble was reported in other foreign 11 countries. And the cause was very simple careless mistake. This cause was the expired software certificate of "Packet Switch" which relays data supplied by Ericsson (Telefonaktiebolaget LM Ericsson).

With such small and careless mistake, tremendous confusion was caused in world widely.

Also, I thought that such trouble occurs with very simple and primitive defect.

In the past description, I introduced the name of *ASAHI Iron Works* and his development, which is the **Mieru-Ka**: visualization activity with AI, IoT, Sensor and Tablet terminator.

And for instance, the system of *Cycle Time Monitor* with IoT is:

Cycle time monitor sends machine stop time, production quantity and cycle time information from the transmitter attached to the factory machine to the receiver, and data is transmitted from the receiver to the cloud.

On the cloud, analyse the gathered data to extract the tasks so that smart phones and tablets can refer to the machine operation status and tasks in real time.

And the Cycle time monitor can be used the data of operation time & stopping time, number of production & individual cycle time, history, SMED and analysis of stopping machine.

Now for factory management including machine management, the use of AI & IoT is been expanding very rapidly. However, it is a surprisingly simple mistake; infrastructure cannot be used easily.

I don't know whether the factories introduced AI & IoT with Cloud got the troubles caused of Ericsson or not. But we need to understand that how a weak infrastructure we live in.

Next Page note: "Edge Computing" explained by Wikipedia: *"Edge computing is a distributed computing paradigm which brings computer data storage closer to the location where it is needed. Computation is largely or completely performed on distributed device nodes. Edge computing pushes applications, data and computing power (services) away from centralized points to locations closer to the user. The target of edge computing is any application or general functionality needing to be closer to the source of the action where distributed systems technology interacts with the physical world. Edge computing does not need contact with any centralized cloud, although it may interact with one. In contrast to cloud computing, edge computing refers to decentralized data processing at the edge of the network"* https://en.wikipedia.org/wiki/Edge_computing



Flying notes by sensei Kimura

Use Cloud for factory management:

I recommend to use edge computing rather than cloud.

Above example this company uses the environment of cloud. But the use of cloud is relatively slow response and with risk.

Slow and with risk? ...In cloud computing, orders, questions and answers go through various paths. The paths are from the smartphone or tablet terminal to base stations, to the exchange station, the Internet from the core network of base stations, exchanges, to the core network of the mobile phone operator and then they are connected to the Internet, and they also go through the connection points in the Internet from there. (If the server is in a foreign country, the result will be returned from there via overseas network connection point, overseas operator network, and cloud server.)

Depending on the case, cloud computing may even require hundreds of milliseconds to get results after taking action on some terminal, even a few seconds if there are many.

If such situation, it is not possible to call "real time response". As you know gradually the use of robot in production line by general company is increasing. And if there is no environment of real time response, the robots in production line which are in automatic control with AI & IoT network have troubles. For realizing real time response, edge computing should be used.

Of course, if using edge computing in factory, there is no concern about such Ericsson or provider troubles, because of the closed loop of only for the factory.

I introduce a voice of top management of machine manufacturer. It will not make it in time if we raise the data to the cloud and listen to the answer.

In IoT, there have been many systems that analyse the data of each device in the cloud and return the results to the Gemba. However, at the factory, a huge amount of data is generated from plural devices such as industrial robots and machine tools. Processing all the data in the cloud is costly, and also a temporal "delay" occurs.

For example, in a robot which moves the arm at high speed, even if the system can predict a collision between robots when something wrong happens, it will not make it in time by way of the cloud.

In addition, sending data which can be said to be a property of the factory to the cloud via the Internet poses a risk, but data processing at the edge computing can also take security into account.

I will describe the use of edge computing future. In here, please understand that Gemba is developing and changing very rapidly in the development of AI & IoT and Robot.

And, in parallel, unknown machine management factors shall happen.

VII. Skill training

Many times, I said that within one decade a Gemba is changing remarkably, because of the emergence of AI and robot.

And the Gemba of maintenance also not exception.

When you buy a new machine, it already has many sensors and program of diagnose the defects of assumed parts. And obligingly, the combination of AI & sensors informs the troubles to the machine-tool manufacturer. Then the manufacturer takes suitable actions which are visiting & repair, informing & prompting to repair and of course never forget to accumulate the data.

The AI & sensor also informs you the problem before occurring serious break and inform the point of repair.

But, the skill training of maintenance is important.

VIII. Practice of Maintenance SEISO.

Once again, basically the problems found by member of Maintenance SEISO should be resolved by Gemba operator themselves. However.

As a company, it is quite difficult decision. Why?

How the management can have the trust of the Maintenance SEISO member (Gemba operator). The top management needs to leave the job which it is necessary to repair a company's important property to Gemba operator. If they fail and break down it, who can take the responsibility. A manager decides to introduce the maintenance Seiso in Jishu-Hozen activity and gives the challenge opportunity to Gemba people recklessly.

And massive defects happen or the machine is broken, because of failed maintenance. In such case who can take the responsibility. No body. Nobody can take the responsibility. Because.

The decision of TPM introduction is made by top management. And factory manager introduces the Jishu-Hozen in his factory based on the top decision. And he fails in no background improvement.

Then factory manager becomes to feel the fear of failure and the best way to be the PM (preventive maintenance) level for him. And he keeps the current maintenance system with just maintenance department activity.

Now...

It is not possible to say TPM if **Jishu-Hozen** (which is autonomous maintenance activity by Gemba people and maintenance department based on the management system) is not implemented.

Again **Jishu-Hozen** is the key element of Total Preventive Maintenance. Then, I never want to threaten managers who are progressive and want to introduce TPM. My suggestion is to check your company and know the capacity with my Factory management Checklist (which is constituted of 11

categories and total 110 checking items). And if you cannot gain more than 75%, it is necessary to improve the capacity of factory management (background) and shouldn't challenge the step of Jishu-Hozen involving Gemba people recklessly. But

Still you may desire to challenge TPM introduction. Also, you may wish to use the TPM introduction for changing and improving factory management.

So, I recommend to improve **both side of Gemba and management**.



My suggestion is multifaceted activity.

- One is Gemba improvement in mental and technical themes.
- One is Administrative improvement in control system which includes policy control.

In Gemba, as I have written in somewhere, I recommend to establish the **Kaizen Committee** which involves 5Ss activity, Safety Committee, QC Circle and Kaizen suggestion scheme and small group activity.

Now please understand...

It is impossible to introduce & stabilize TPM if there is no such managerial background and Gemba capacity which include the necessary mind.

As **Jishu-Hosen** introduction and maintenance Seiso one of suitable activity is small group kaizen. And to implement Maintenance SEISO I use this system (which includes QC Circle).

Again, my teaching style is to develop both side of Gemba and management.

IX. One lecture in a company.

In here I would introduce one story how I led the introduction of Jishu-Hozen in a company.

I was invited and asked to make a lecture regarding TPM introduction. So, the attendances are just 9 top managements (I call them directors.)

Before going to my lecture, I confirmed their purpose and desire.

The desire of this company (middle class scale manufacturer) was as next.

1) To recover or increase the profit in sales amount recovery.

2) To develop managerial level in introduction and stability of TPM.

This final goal was agreed by all top managements.

In the dialogue I explained the necessary activity which are in Gembas and in management.

3) In Gemba:

Committee of 5Ss, Safety and Kaizen. Including QC Circle, Suggestion scheme and small group activity.

To formulate the mind of "All people's participation" and "Share the sense of value" and also to implement Kaizen.

4) In management:

KPIs, Policy & control, Visual control introduction, Target control, Monthly Management meeting, Education & training & evaluation system, PM introduction & stability, Proper investment.

But, from the first, the conference became complicated.

In the memorandum of my note, I recalled my lecture and dialogue as next:

—Sir we wish to introduce just TPM. Why is it necessary so many things? Again, our wish to you is TPM introduction. And we ask you that: What TPM is? ...And what the proper step to introduce is?

—said the Director meanwhile other top manager also agreed his remark.

—Once again, I confirm your wishes. So, your wish is to introduce and implement TPM. Am I right? —I asked meanwhile at the same time they agreed.

—Another one basic question —I asked—. Do you wish my teaching and leading?

—Yes, we wish your teaching. But... —they doubt.

—Everyone. Please understand —I asserted— Teaching what TPM is easy. And I believe you know what TPM is already. The difficulty is to introduce and stabilize and also implement it. Moreover, I think you think that TPM introduction and implementation are just production Gemba activity...

—Also, you think that just making decision and order to the Gemba are enough to TPM introduction & implementation, don't you? —I let them doubting just a little—. OK, let's discuss one by one.

TPM Introduction in Gemba

—Firstly "In Gemba".

—At present in your factories Gemba's people haven't the necessary mind. And, the necessary minds are "**Share the sense of value with company**" and also the mind of "**all people's participation**" —and I continued...

—Also, this phenomenon is there in administrative departments. In short, your company is divided and has the wall of separation. This phenomenon is not rare in the world, but unfortunately is general. However, your wall of separation is too high...

—When looking around factories, I felt "cold" which meaning is that the people's mind is just money and work to money or is to work for just spending hours. So, do you also think that company pays money therefore they need to work for the effects against payed amount of money, do you?...

—Unfortunately, I cannot feel the Gemba people's "engagement" to your company or organization and work —I said meanwhile some interested faces were shown in the group.

—Now please understand that to introduce & stabilize TPM it is quite natural thing to develop management system also. Because TPM (or other innovative system) introduction requires the management commitment. Particularly management mind-set also is required to develop...

—Another word, management needs to use this opportunity to change & develop the current style —and after a little thinking pause, I continued...

—You intended to introduce and stabilize the TPM system... Why? Why you wished to introduce TPM? ...Probably you also felt that it is necessary something improvement —and I stop my dissertation for a while...

—When visiting & looking around your factories, I felt something abnormalities...

—Anyway, TPM introduction is not only the Gemba activity, but also the development of management system. Because your score in my Factory Management Checklist⁷ showed a low level...

—And your concern or disagreement point is the process (to introduce TPM). Yes? —I asked them and continued.

—Again, I asked you to check your company using my checklist. And the result was unfortunately 43%. And in all categories (11 categories) your score was lower than middle...

—Therefore, I recommended to improve the management system also with this opportunity. To improve management capacity is essential matter for your company —I judged that to improve to his wish, it might be necessary some years. Then I thought it is necessary to spend time to let them understand the situation and I continued.

⁷ **The Factory Management Checklist free access in Google Drive:** "Factory Management Checklist ESP-ENG.xlsx" <https://drive.google.com/file/d/1P58oJRZHwHqvRYf3kDUNUAHWNfBSUgzG/view?usp=sharing>



Flying notes by sensei Kimura

Engagement as one of base of Motivation.

In a book the meaning of Engagement is explained as next.

"A state which each employee has a loyalty to the organization and is feeling a bond with [heartfelt attachment] in sympathizing with direction and goals".

To obtain the employee's engagement, the company's commitment is important. And the necessary direction is one of 3Ss which is Employees satisfaction (many times I have described that 3Ss are Customer satisfaction, Society satisfaction and Employees satisfaction.)

Steve Jobs said as next.

"Work occupies the majority of life. To get true satisfaction, there is no way but oneself to seem it to be wonderful. And, to do the wonderful work, there is no choice but to love own work".

To gain the employees engagement, it is essential to give the Employees satisfaction.

To give the Employees satisfaction, the company needs to provide the circumstances of to let them love their work.

How? ...Let's look at Engagement more deeply.

According to the conference board of US National Industry Council, 96% of employees make their effort to keep high engagement to their job.

When talking about this report to my friend who was a Human Resources professional for long years, he told his experience:

"It is quite true that most of 100% of new employees show high engagement to the company and/or organization and new job.

Also, it is quite true that however many employees struggle to realize or keep it".

There is no doubt that employee's engagement to their job and/or organization is one of essential factor for the success (of both themselves and company). The employees who have high engagement have high passion, energy and motivation. Then they contribute to high performance, creativity & productivity. Therefore, not only increasing performance such sales or production amount, but also the employee's happiness increases.

In contract to this, low engagement causes Burnout syndrome, high turnover rate and undesirable workplace behaviour.

Therefore, as a company to increase employee's engagement is very important.

So how can we increase the employee's sense of engagement?

Engagement as one of base of Motivation. II of III

There are 2 ways:

One is to employ high engagements sense persons.

When watching and chasing new comers, really there are the persons who are basically high engagement persons and not or normal. I think it is caused to their fundamental temperament.

According to my friend (was Human Resources Department person) and when interviewing new employees, he could observe to find the natural engagement in 4 points which are Affirmative emotion, Positive emotion, Sincere emotion, Extroverted emotion.

Then it is possible to choose just high engagement persons willingly. However, as I describe later, employing just high engagement persons in their temperament is not good for a company.

In my experience I could understand that a company needs to keep the "diversity".

I have described in somewhere, to establish healthy group or organization it should be considered "**Cognitive diversity**".

Then it is necessary to mix high engagement and not or normal to keep health group or organization.

Again, the group which is constituted of and gathered just the seemed to be high engagement persons cannot show good result. And the group which is mixed high engagement persons and others can show higher result. It is said "**cognitive diversity**".

Also, it is not realistic to choose and hire just high engagement persons. Therefore, this idea is not recommendable.

Another one is to provide good circumstance to keep high engagement.

Again almost 100% employees have natural engagement. But unfortunately, they lose the mind. Therefore, a company is necessary to make effort to provide good circumstance.

How? ...I wrote above most of people whether have high engagement temperament or not wish and struggle to keep engagement.

On the other hand, in what condition is to maintain or help to keep engagement.

In general, following 3 conditions to keep employee's engagement.

- 1) The job contributes or realizes the things which have the sense (meaning).
- 2) The person is given the responsible authority to the job 1).
- 3) The person is possible to feel the connection with others.
- 4) The environment and leader or superior are fair, ethical and to reword and evaluate to the effort (not the result, but effort).

And when I made the dialogue with the HR professional, we reached to one view.

Engagement as one of base of Motivation. & III

Steve Jobs says "love the job". But how let employee love his job? And, how a company provide the circumstance which let employee love his/her job?

The reached one view is summarized in the above 4 points considered as essential. Based on These:

1. Giving the chance to challenge.
Even small target, let him consider and decide the challenge target. And when considering the target, the manager needs to support and dialogue in sincere attitude.
2. Supporting and following the challenge and let him success.
The manager never neglects his/her challenge and continue dialogue and guide & help.
3. Making fair evaluation.
The result is important. But most important issue is to evaluate the process and his/her effort.
My previous company has an evaluation system. And in the system, there are 3 evaluation points which are:
 - a. Challenge theme; Reasonable and ambitious theme against his capacity.
 - b. Process & effort; Proper use of organization and effort. And...
 - c. Result
 - d. And when evaluating, the weighting is Challenge: 4, Process: 4 and Result: 2. In total 10. (I will write again this in the description of "Motivation" future).
4. Letting him experience the pleasure of success. Then let him/her taste the pleasure of success.

For this story, a small group activity (including QC Circle activity) is suitable. Therefore, I always use this technique for improve Gemba situation.

TPM Introduction in management

—Secondly “In management”: I recommend you to improve next 6 items as the first step:

- 1) **Policy statement & company's philosophy.** As I wrote above keep or establish the Gemba people's engagement it is necessary to provide 1), 2), 3) and 4) environments. And to let them feel the sense of "To contribute or realize the things which have the sense (meaning)", it is necessary to let them know the meaning of their job in 3Ss (Customer Satisfaction, Society Satisfaction and Employee Satisfaction).
- 2) **KPIs and Target control.** As you understand it is necessary to make manage. To make manage of course it is necessary to decide the items of KPIs. And these KPIs should be used for Target control and benchmarking.
- 3) **Visual control.** Many times, I told that it is essential to make "Air" in the factory. And share the information of factory situation visibly. Also, proper visual control is essential tool for factory improvement.
- 4) **Monthly management meeting.** Nowadays management speed is different to old days. Nowadays it is possible to see and know the management data real time. However, it is important to review the monthly result against target and action taken. Nowadays the term of PDCA cycle is shorter, because of ICT development. However, a **monthly management review is essential.**

- 5) **PM introduction & stability.** PM is a physical fundamental of TPM. In ignoring this step, TPM is never introduced.
Therefore, management is required to invest and make organization to bring up engineers who are the keys and seeds of TPM.
- 6) **Education & training & evaluation system.** Management is required to invest to persons more. And it is essential items to establish and commit to TPM introduction and stability. One of key point of success is to establish the Gemba autonomous system.

—Everyone please —I call their attention again...

—To form and operate autonomous system in Gembas such committee is not difficult. In proper condition, the committee works autonomously. However difficult thing is to establish the basic management in administration and in Gembas...

—To improve basic status, it is necessary to spent long term. But, how long? ...In such your level, 3 ~ 4 years are necessary. And I recommend you to make a definite action plan.

—And I think it is necessary to spend 6 months to make up the action plan.

— from 3 to 4years? And... 6 months for planning?! —asked surprisingly the directors—. Why so much time is necessary?

I omit the further explanations but, in my heart, I thought to stop it if you don't like to do! But I continued my lecture as if nothing had happened.

—Anyway, you can decide anything including me to continue the consultancy. But now let me finish the today's lecture —I asked them to teach them the correct way—. In the establishment of management base, I believe it is essential to establish the above 6 items.

—Mr. Kimura —the Directors asked—. It is indeed we found to be something wrong. But we have our policy with statement. KPIs and targets also we have. But unfortunately, it is also true that we couldn't achieve to the target. Therefore, we called you.

—OK. We could have same thought that you could improve nothing in some years. Am I right? ...Why? Why you couldn't improve —I asked them figuratively and also, I continued explaining—. First question...

—Basically, do you need to improve company's constitution?

—Recently we have the risk consciousness in the sales amount, profitability —The directors explained. But what they did not explain was the root cause of that risk, and it was because of discount in sales for competitiveness issue—. And we recognized the importance the cost reduction activity in labour performance, material and machine performance...

—Then —the Directors explained me—, to improve these material cost reductions in scrap reduction & quality improvement, labour performance in machine performance improvement, we believed and decided the TPM introduction to be best solution for us.

—Everyone please —I request them—, understand that this debate is important step to arbitrate between my understanding and your thinking...



Flying notes by sensei Kimura

Digression from the main theme...

In the last description, I wrote the episode of my failing business because of several months survey and making action plan. So, is 6 Months for survey and making action plan too long?

As I wrote before I spend 60% of my effort of consulting for making action plan. And after the action plan, I teach necessary knowledge and make follow up and diagnose the progress & action and effect. And if it is necessary, minor modification of action plan is made.

In my experience there are such action plan modification. Therefore, I prepare alternative ideas when making up the action plan. However, the framework is not changed. (There is no case to require the change of fundamental framework.)

Even so are 60% of effort and so long term for making action plan necessary?

Always when discussing a consulting job with western clients, they express their dissatisfaction which they feel too long and heavy preparation.

Generally, the senses of Japanese and Westerners including USA regarding preparation are different. But Japanese feels the necessity of making sufficient preparation.

Westerners also know and make planning. But it is not so deeper than Japanese. And wish to do "Try and Error". The attitude is "Anyway try, and if there is lack or defect find and try other idea.

Initially I explained the differences as Agricultural tribe and Hunting ethnic.

But recently, I read a paper written by Professor Julie K. Norem (Wellesley College).

According to her paper she categorises the human mentalities to Two.

One is **Defensive Pessimist** which it concerns the failure and even though succeeds, after the success next might failure. Anyway, the mind is pessimistic.

And most of Japanese is this type. And I'm a Japanese. Then, I wish to do very deep diagnosis and investigation, ideas with possibility & economical evaluation, preparation of alternative ideas and prudent time schedule.

In Japan there is a saying: "Knocking on a strong stone bridge before crossing it". It is the meaning of to be over-prudent. In that way, when I was in UK, one day my friend told me an irony that "SUMITOMO doesn't across the stone bridge even knocking it". So. Japanese gives the importance to deep and logical preparation.

And another one is **Strategic Optimist** which it is thought to be OK even though there is groundless. And, in my experience, Westerns might be this type.

But please understand, I never say which is better. And I'm Japanese. Therefore, I don't feel fine if I don't do like so.

—You need to reduce cost for keeping sales competitiveness. And to resolve cost problem, you wish to improve the performances of material, labour, quality and machines. Then, you decided to challenge the TPM introduction. Am I right? —I asked followed by some further digression because this question is not related to the TPM introduction—, and please, let me know the process of this decision making of TPM introduction...

—Who did propose it? ...And by whom did it accept?

—Initially we discussed the introduction of Lean method. But, one director proposed TPM. And everybody agreed it —said one director.

ADKAR process

—OK. Please accept a little more to make dialogue about the process of this decision making —I explained just a little more—. Everyone, do you know the famous process of organization change which is ADKAR process. Let me shortly explain you that:

- I. **A (Awareness):** To let ones understand the necessity why the change is required and what is the problem if not implemented;
- II. **D (Desire):** To motivate to change, giving vision, strategy and image when realized;
- III. **K (Knowledge):** To provide the knowledge about the process, method, roles to the change;
- IV. **A (Ability):** To let ones learn the necessary skill and behaviour to implement the change;
- V. **R (Reinforcement):** To strengthen the motivation to stabilize the change.

—I believed that you are eager to change with through the introduction of TPM. But I cannot feel your enthusiasm. When looking around your factories and offices, unfortunately I couldn't feel the eager not only in production gemba but also in office gemba —and I continued...

—Obviously the Gembas are "cool down and cold". Again, above process ADKAR is essential for change. And also, I believe TPM introduction must be your very important strategy. So, question everyone in the ADKAR process: **A (Awareness):** Do all people know the necessity of this innovation? —I asked them.

—Sir —doubt the directors—. The company's situation is not so serious and never in desperate state. But we feel the deadlock coming in near future. If continue the same state, we lose the major business —and they continued in one voice...

—Therefore, we need some plan to recover within existing the corporate strength. Then we learned Total Productive Maintenance and the 8 pillars. And also, we considered the process of introducing Total Productive Maintenance in Nakajima's 12 steps.

—It is good. And? —I asked with a little criticism—. How's progress in the 12 steps? ...You spent 6 months already.

—We decided the policy and prepared the policy statement —they admit—. But we do not forward to the next process. We thought that some kind of leader is necessary to improve the matter. Then we invited you.

—Very good and, thank you for your invitation. But I don't follow the Nakajima's 12 steps, because there are losses of time —and I continued—. If you like to follow the TPM 12 steps, I suggest you to start 12 steps at once...

—The steps of 1 to 5 are the office level, I mean it is a brain exercise. And from 6 to 12 are actual practice in Gemba. So, I say that you should start all at once —I explained them and I went further...

—The steps of 1 to 5 are done in a moment, when comparing to Gemba activity processes, because these are just brain exercise. And from 6 to 12 such Gemba activities are necessary very long term for instance 6 years to stabilize and to expect sufficient function...

—Why is it necessary to follow the step? ...For example: If there is a chance of new products introduction, it is quite good opportunity to consider and plan the "Chasing easy-to-make products and easy-to-use equipment" (No.8. Establish Development & Management system of Products and Equipment). Why do you need to wait other steps to be done? —I asked them figuratively.

—And use this opportunity and never wait the order of 12 steps. There is no meaning to wait the finishing up to No.7 step —in this way I explained to start with the first step...

—If you have this opportunity now, you must consider the system of "Initial Products Quality Control" and establish the committee as one of organizational and ordinal job...

—For example: If "2. TPM education and Campaign " isn't yet, you establish management team and Gemba kaizen committee. And you can and need to finish the steps of 1 to 5 at once...

—The management team is constituted of all managers who are top managements and section managers and participate in regular monthly management meeting. And then, start the study...



—So, **the tasks of management team** are:

1. **Making policy statement**
2. **Confirmation of current status in safety, sales, cost, productivity (machine, material, labour efficiency) and quality.**
3. **Study of necessary knowledge (such TQM, TPS, TPM)**
4. **Decision of TPM (if TPM is suitable) and study.**
5. **Target setting.**
6. **Action plan.**
7. **Establishment of Gemba Kaizen committees.**

—And —I continued—, at same time establish the **Gemba Kaizen committee**...

—In that way the tasks of management for establishing Gemba Kaizen committee are:

1. **Declaration.**
2. **Choice and nomination of committee members.**
3. **Organization.**
4. **Identifying the task.**
5. **Regular meeting with members and suggestion.**

—And, the task of committees is:

1. **5Ss preparation.**
2. **5Ss implementation.**
3. **Regular Safety patrol and suggestion and implementation.**
4. **Suggestion ideas evaluation.**
5. **Small group activity and QC Circle evaluation.**

—Again, —I pointed out— I know it is not possible to expect sufficient effect from the first and it is required the history. For instance, Gemba Kaizen committee is constituted of one leader (supervisor or group leader class), one advisor (section manager class) and appointed persons (workers from each factory, engineers, office staffs and). And the term of office is 6 months...

—Initially the activity is in groping stage. It is natural if you have no experience. Indeed, in such situation, supporting and encouraging are the management's task. And the important thing is anyway starting. In that way, start from 5Ss is good idea.

—In Kaizen committee please provide the condition of small group activity and QC Circle. And start the Suggestion scheme firstly. Also, this suggestion scheme is used for maintenance SEISO.

—In Gemba committee, discuss the TPM and provide the opportunity of education. And, maintenance department starts the education and evaluation of maintenance engineers who should be the teachers of Jishu-Hozen. Chose a model machine of maintenance Seiso. And let the engineers experience the maintenance Seiso by themselves. Please don't forget that let the engineers learn the instruction manuals. Because it is necessary to avoid the misunderstanding and their own way. They need to teach the true construction and methods —in that way I explained also the role of maintenance engineers at first step...

—After the engineers training, let's start ***Jishu-Hozen*** to operators. Establishing small groups. One group constituted by 3 operators. Also, decide a machine. Teach the machine maintenance in the instruction manual. If it would be a large matter, divide and decide the part to clean-up...

—Let them clean-up in **Pika-Pika** and start **Putting Card activity**. And when they could find an abnormality, this is recorded as **One of Kaizen suggestion**. For instance, one Kaizen suggestion is awarded \$ 8 (in SUMITOMO case and No. 8th rank award which is lowest rank). But the award is decided depending upon the country situation —I concluded.

A doubt was then glimpsed in their faces.

—Sirs —they called my attention—. We think that it is impossible to start all at once. And we believe it is necessary to progress in order of 12 steps —Directors said.

—OK. Please advance in your thought. But I have a concern about your step and progress. You have already spent 6 months, haven't you? How is the progress in 12 steps? ...—I asked them figuratively—. No, it is not necessary to explain me. I already saw your Gembas. And, I could understand the status.

—I hope you to reach to No.6 step before you to be on the burnout syndrome. Your factories and offices including you, managements members, are already burnout before reaching to Gemba activity (including office Gemba) —and I continued...

—Another word —I trained to explain in the easiest way—. You felt your satisfaction in just planning, brain exercise. Your managers and staffs romped to make plan, plan, plan. And after finishing the brain exercise, they don't have their interest to it...

—I call such situation xxxx (sexual term). So, why they don't show their interest to it after the brain exercise? —I asked them and also figuratively— ...The answer is simple and is you, top managers don't show the interest to it and, it is quite natural to disappear the passion in the Gembas.

—Again, I never recommend to follow the 12 steps because of 2 reasons:

1. **First reason is;** the burnout syndrome or plan, plan, plan and brain exercise and feeling satisfaction.
2. **Second reason is;** it is no meaning and no rationality to follow it.

—The case of this situation is not rare, but many. Therefore, I recommend to establish core system which works autonomously. In the old historical proverb, there is a word that:

"Strike while the iron is hot."

—I believe when launched the policy of Total Productive Maintenance, everybody was hot. However, after deciding the action items and target setting, again the corporate illness raised his head which they merely implemented an evasive some easy but ineffective action items and not implement essential but difficult items —and I tried suggest one conclusion—. This is your current corporate status.

—Somebody of your group —I pointed out— told me that one of serious problem is the capacity to complete necessary themes planned —in that way I tried to conclude—. Also, **the item planned doesn't exert the effects planned**. —I was very sorry to had shown many abuses...

Gemba-Ryoku

—But again, I say that "Strike while the iron is hot." And, while hot, making-up the fundamental system which is autonomous system in using **Gemba-Roku**. —I clarify— So, **Gemba-Ryoku** is the Gemba Force or Capacity.

—And, what is the system autonomous by Gemba? ...**It is Committee activity:**

I describe them again later, but now shortly as an attachment to the dialogue in this company:



Kaizen Committee: The Kaizen Suggestion Scheme, Safety regular inspection, 5Ss activity. All of them in Production Gemba and in office Gemba.

Safety inspection is Regular Gemba check and suggestion to management and Kaizen which are improvement by themselves.

The Kaizen committee; Representatives participate to the meeting of TPM meeting to decide the 4 items. I detailed them again:

1. Making policy statement
2. Investigation of current status in safety, sales, cost, productivity (machine, material, labour efficiency) and quality.
3. Study of necessary knowledge (such TQM, TPS, TPM)
4. Decision of TPM (if TPM is suitable) and study.
5. Target setting.
6. Action plan.

Management team establishment; All managers are involved in this team. And to establish meeting method:

1. Monthly base.
2. Managers to bring 3 kinds data. One is the result to target of previous month and second one is the prospect of current month and countermeasures to current month target to achieve. And third one is the perspective of next month of each action items.

And...

A project establishment;

—Making committee in Gemba, it is understandable and probably we can. But from (1) to (6) participated by the committee? —doubted and asked the directors.

—Please listen till the end —I required them—. Gemba committees cannot implement everything, but can and should participate to the discussion...

—The special project takes the responsibility of preparing the ideas of (1) to (6). Therefore, the special project members are not just engineers, but mixed HR, Sales, Accountant, Maintenance, Material etc. widely as much as possible...

—And (1) Making policy statement: Base policy which is to improve corporate status with the introduction of TPM is already decided by top managements. But, let the committee and special

project make the special statement of TPM introduction with their word. Also, (2) and (3) are their important tasks...

—Can I get your agreement? —finally I questioned them.

Let me, please, omit the dialogue after the question because It is not relevant for the issue, but the next one.

—OK. Next. —I continued forward—. (4) Decision of TPM (if TPM is suitable) and study...

—Based on the outline knowledge and current corporate status survey, the committee and the project need to decide and confirm the direction which still TPM is suitable of choice or suggest other way to top management...

—Normally I recommend (2), (3) and (6) as the job of the committee and project. However, your company is a little serious illness. Then, I recommend as above. Can they do or not? —I concluded with this figuratively question and continued...

—Consideration and discussion of this point is not suitable. Your firewood is already wet. And with the normal way, it is not possible to make a fire. Anyway, please let them talk TPM with their voice. And, it is not the meaning of your watching calmly. If and when they require your participation to the meeting, it is good chance and make answer. But never express your ideas.

—Sir —They pointed out—. Our corporate status is not so serious.

—I never say that your total corporate status is serious, but say just the situation of TPM introduction —I answered.

—OK. We understood and we will do your suggestion —they accept and the passed to the next step—. Next question is the steps...

—You told us that the 12 steps are not suitable. And you recommend us to start all steps at once. Is it possible? —they asked dubitatively.

—I don't say that it is not suitable, but say that it is no necessary to obey the order of the step. —Then I asked— Up to when do you wish to finish all 12 items?

—We have already presented our policy of this year. And therefore, we desire to complete until the end of next financial term —directors answered.

Let me to summarize my answer to the directors because it was widespread...

—Clearly, I need to say that a little longer term is required. For instance, more than 3 years. When starting this activity, some effect will appear soon. However, most difficulty thing is to stabilize not only the system but also the corporate constitution. And, to confirm the effects planned and the system stability in corporate constitution improvement, it is necessary the 3, 4 years term at least —I explained due to such low-level factory.

—When looking the result of Factory Management Checklist, your corporate and management status are low to introduce and stabilize it. And, when I teach, I intend to improve all areas which are new system (TPM) introduction and stability, management system introduction and corporate constitution improvement, which includes the mind of **"all peoples participation and share the sense of value"**...

—Again, introducing the new knowledge and system superficially is easy. Most difficulty thing is to improve the corporate constitution —I explained them which is essential item to stabilize the system.

—Anyway, I understand that you desire to implement this program and complete as soon as possible. Right? —I questioned them figuratively and expecting an affirmative answer.

Now 12 steps start at once.

—I tell the "Second reason" It is no meaning and no rationality to follow it. But You believe that these 12 steps must be followed as the order, do you? —I asked them and explained further— And, there are 3 parts in these 12 steps:

—One is **Step of Introduction Preparation** and another one is **Introduction & Implementation**. And the last one is **Step of fixing**.

—Now, one question, I believe you know the Part Diagram, do you? —I did not expect any answer really.

—What is the critical pass for introduce and stabilize it? —again, I did not expect any answer from them because it was a figuratively question.

—The longest critical pass is "7. Establish system of Effective production system". And, in this part, there are 4 items which are:

- 7-1. Individual (Kobetsu) Kaizen
- 7-2. Autonomous maintenance (Jishu-Hozen)
- 7-3. Planned preventive maintenance
- 7-4. Education and Training

—And, in these 12 steps there are the items of "10. Establish System of effective administration and indirect departments" and "11. Establish Control system of health & safety and environment". And, particularly, this No.11 is essential, because this is connected directly to the Gemba welfare...

—As a Gemba's activity, 5Ss and Safety in Kaizen committee are worked on. In parallel relevant administration departments also is required to make system or review current system as a special activity in TPM introduction declaration...

—Why do you need to wait till finishing No. 7 step to No. 10 step for No.11? —I asked them figuratively and I answer myself— It is against the goal.

—If, for instance, HR department intends to make action plan for No.11 by just himself, it cannot be expected sound action plan and implementation, because there is no reflection of Gemba voice.

—Moreover, I believe that you also are agreeable that the critical pass is No.7 which requires the minds improvement of "**All people's participation and Share the sense of value**".

—And this road requires quite long term. So, does HR department wait until the prospects look bright of No.7? —I questioned them also figuratively because I knew the answer—. It is ridiculous, isn't it to wait some years?

—Why don't you work in parallel in the activities of production Gemba, office Gemba and administration Gemba which are related each other? —I asked them as a form of structure their minds in the correct way not because I expected any answer.

—Again, —I continued— please consider these items: The item of "10. Establish System of effective administration and indirect departments" also is no necessary to wait the step of "7. Establish system of Effective production system". —and I continued detailing some contradictions of the Nakagima's 12 steps about the order to implementation into this company.

—In No. 7 there are "7-4. Education and Training". So, education and training must be implemented in Jishu-Hozen and daily OJT. Is this necessary to be after 7-1. Individual (Kobetsu) Kaizen: Project team activity and small group activity"? —I asked them knowing the answer—. It is no necessary and these must be implemented at same time and at once...

—And also, "7-3. Planned preventive maintenance" can be done by maintenance department as his normal job. And it is no necessary to follow the order. Also, this doesn't need Step of Introduction Preparation. As the part of Preventive Maintenance, the maintenance department can challenge as his normal job —making a little pause in my dissertation.

—Of course, —I clarify— maintenance department needs to do special activity for establishing PM system under the declaration of TPM introduction...

—Again, a small group activity in "7-1" is done in Maintenance Seiso of Jishu-Hozen.

—My understanding of 12 steps is a list of necessary items, but it is no necessary to follow the order —and I explained, in detail, some of the reasons again— In this way there is no necessary to divide Introduction & Implementation and the step of Step of fixing. Long days later and if you wish to challenge such prize, you consider it (Step of fixing) at the proper timing. And, it is no necessary to think this item. And now you need to consider how to develop the people's mind (all people's participation and share the sense of value) for the Step of fixing...

I detected some face of confusion, but I asked —May I conclude? —I question them figuratively because I sensed the long explanation might cause some confusion and, in that way, I summarized as next.

1. Make Gemba Committee and special project team.
2. Establish Management team and meeting.
3. Start all activity at once.

—Sir —director asked me—. Still we have a concern. Is it possible to start at once? —they doubt.

—You have many departments and sections, do you? —they answered me using an affirmative movement of the head—. I say that it is no meaning, no effective if you follow the order of 12 steps...

—You produce products with considering better quality and efficiency, do you? ...For instance, PM (Preventive Maintenance). PM is essential base for TPM. And it is possible to include "Planned preventive maintenance". You have already your maintenance system. I know that current system doesn't work well. Therefore, you have concerns. —I continued...

—But this department doesn't need to wait progress of the 12 steps. So, they can improve by themselves with the commitment of top management and proper teaching —and I explained some basic issue in the excellent management as next—: **One of essential event is to delegate the things to the departments as a daily job for stabilizing system...**

—Soon this maintenance department will have the task of teaching operators about machine instruction manual, Seiso points and actual Seiso activity etc...

—So, it is acceptable to start from 0, but start now —I conclude but I wanted to give them another example as the next one...

—For instance, "11. Establish Control system of health & safety and environment". In Japan such theme should be taken the necessary activity and responsibility by Human Resources. I don't know your organization. But I believe you have proper organization for this theme. So, this case also not necessary to wait the progress of 12 steps. And it is against —I declare.

—HR is required to make action plan to achieve the target. And HR department also is required a special activity in the declaration of TPM introduction...

—You establish the committees in Gembas (production and office) and special project team. But, please understand that actual activity such Jishu-Hozen, 5Ss, Safety activity, Gathering data of KPIs etc. must be taken the initiatives by current organization —I conclude this another example and I taken over just little justification about their concerns.

—By the way, still you have concerns about my suggestion which to start at once and no necessary to obey the order of 12 steps, do you? ...Then I want to confirm your wish. By when do you wish to complete this activity?

Nakajima's 12 Steps		
Step of Introduction Preparation		
1	Declaration of TPM Introduction by Top	Declaration in Management Team Meeting and Board Meeting. Declaration in TPM internal course
2	TPM education and Champaign	Managers: Course and camp for individual class managers
		General employee: Declaration in employees course in VTR.
		Declaration in leader's education and internal course
3	TPM promotion organization and staff organization model	Setting the committee, speciality subcommittee and secretariat Deployment of the staff organization model
4	Establish basic TPM policy and Goals	Management goal, Activity target, Clarification of activity policy BM setting and creation of kaizen theme in Loss investigation
5	TPM deployment master plan	3 years master plan, Yearly base, quarterly base action plan and Monthly base schedule
Step of Introduction		
6	TPM Kick-off	Re-declaration of the policy to customers and suppliers (Invitation for customers and suppliers)
Step of Introduction Implementation		
7	Establish system of Effective production department	Chasing the limit of effective production
7.1	Individual (Kobetsu) Kaizen	Project team activity and small group activity
7.2	Autonomous maintenance	Step method, Diagnose and certificate
7.3	Planned preventive maintenance	Betterment preventive maintenance, Regular preventive maintenance and preventive maintenance
7.4	Education and Training	Group education for leaders and Transmission to employees
8	Establish Development & Management system of Products & Equipment	Chasing easy-to-make products and easy-to-use equipment
9	Establish Quality maintenance system	Condition setting that not cause defect and maintenance
10	Establish System of effective administration and indirect departments	Production support, streamlining own department, streamlining equipment
11	Establish Control system of health & safety and environment	System of 0 accident & disaster and 0 pollution
Step of fixing		
12	Implement TPM fully and level up	Challenge higher goals than auditee of TPM award of excellence

—Sir —directors said then—, we have already started our activity and spent half year as we have told. Then we need to gain some effects in this financial year and at least up to the next financial term we need to complete this activity.

—Ah, just as I thought —I already suspected but I was not sure about the matter—. As I suspected, there are differences between your time scale and mine. Again, I confirm your wish. You wish is to stabilize TPM, do you? ...How do you think which is longest term to be necessary?

—We understood and also think that it is the step of "7. Establish system of Effective production system" and the Individual (Kobetsu) Kaizen, Jishu-Hozen and Quality maintenance in 8 pillars

—directors explained me more in detail—. Establishment and stability of these are the critical pass of the activity.

—Very good. You understood correctly —I was happy of their understanding—. Now I wish to review you saying 8 pillars of JIPM. Who are the leading actors for the 8 pillars? —I asked and also I answered.

—According to the explanation of JIPM, **Individual (Kobetsu) Kaizen** is explained as "**Kobetsu Kaizen for effective production system**". And, It is to investigate and quantify losses by production process and equipment to reduce losses and gain real profits. **By whom?** —I asked figuratively because I did not want actually their answer before the mine— **By Gemba people**.

—And, **Jishu-Hozen** is explained as Establishment of "**Jishu-Hozen system by operator**". So, this activity also the leading actors are Gemba people.

—Also, **Quality Maintenance** is explained as **Establishment of Quality Assurance System**. And, It is an activity to prevent the loss of defects by setting conditions that will not cause defects, maintaining and managing the conditions, and predicting in advance the possibility of the occurrence of defects.

—Then, again who are the leading actors? ...I believe you could understand. And the leading actors are production Gemba people. And the essential condition of Gemba activity is "**all people's participation and the share the sense of value**". But and unfortunately, the engagement of your Gemba people seems to be very low —I tried to give them one conclusion of my digression.

—Therefore, you need to bring up the Gemba people's mind with through this activity. In my experience it is necessary to spend at least 3 years. From now 3 years is necessary to bring up.

—By the way —I made a pause to explain in a better way some other concepts—. Other pillars in 8 pillars of JIPM...

1. **Planned maintenance system is explained as "Create a planned maintenance system for the maintenance department"**. And, it is an activity by the maintenance department. And, it is an activity that aims at zero failure and maintenance cost reduction by performing machine deterioration diagnosis and restoration, and extending the machine life by improvement maintenance.
2. **Creation of management system of product and machine development**. And, it is an activity that aims at putting production on track in a short period of time in the development and design stages of products and equipment, preventing losses and problems that are expected to occur during production.
3. **Create a system for education and training**. And, it is an activity that organizes the knowledge and skills to be necessary to proceed with work, and improves skills to reduce and prevent loss.
4. **Creation of an efficient system for management & indirect departments**. And, it is to support activities to reduce and prevent losses at production Gemba, and to conduct similar activities in its own departments.

5. **Creation of Management system of health and safety and environment.** And, it is an activity aimed at achieving a workplace with zero disasters, zero pollution, zero garbage, and a comfortable workplace.

—The leading actors of these 5 pillars are the office Gembas including management. And these areas activities are such brain exercise and to make up "the frame of control". These are also important and essential. However, there are no necessary to spend so long term comparing to the production gemba activity.

—Moreover, these frames must be considered before "7. Establish system of Effective production system", or in parallel —I repeated.

—As you understand the leading actors of production Gemba and Indirect & management are different. Therefore, keeping the order of 12 steps and your image which it is impossible to implement 12 steps at once are wrong. In this way, this activity is never the starting from zero, and you have the organization already even though it is not working well —and I tried to enter in more detail...

—With the frag of TPM introduction as companywide activity, you use current organization and reform it —I conclude.

After a little thinking pause, the directors recognize some kind of requirement to reform the organization.

—We understand that current organization is required to take the responsibility of TPM introduction and stability. And, with through the activity it is necessary to reform current organization also. And also —the directors doubt—, in parallel we establish the committees and special project.

—What is the job role of them? ...Does it necessary to establish these? ...Because again current organization need to take the responsibility, doesn't he? —the directors asked.

—Why your organization including factories doesn't affect well? —I asked them and I answered also by myself—. Of course, TPM implementation is done in production Gemba. And the responsibility of the implementation should be taken by factories. And other indirect organization such accounting, HR, Sales and top management and managers are required to support production Gemba activity...

—This team play doesn't work well because of some knowledge issues, managerial methods and team work. —And I asked them a question related to their organization doubts— What is the job role of Gemba committees? ...In short. It is to prepare the necessary condition to introduce and stabilize it.

—It is impossible to introduce TPM in the current Gemba condition in both area which are 5Ss condition and people's mind —I explained...

—The exact job role of the committees is Safety, 5Ss, Kaizen etc., and not related to machine maintenance issue. But these are essential to introduce and stabilize it (TPM). In that way, the tenure of committee members is 6 months and change to next group. And the committee activity must continue at least 3 years, (but if possible, continue permanently). And let all people participate to the committee. Of course, it becomes a mannerism. And management devise is necessary...

—And, what is the job role of special project? —I asked figuratively—. Everyone, I would confirm once again your desire as next:

- a. Recovering or increasing the profit in sales amount recovery.
- b. Developing the managerial level, introduce and implement TPM.

—In your desire there are 3 factors —I detailed then as next:

- a. One is recovering the profits.
- b. One is recovering the sales amount.
- c. And another one is improving the managerial level. And...

—In order to achieve all of these, you chose TPM introduction. Am I right? —I questioned them knowing the answer— ...Please consider that TPM is a method and one of tool to realize these 3 targets.

—I don't know the process why you chose TPM. However —I thought just a little bit of time—, I think it is not bad choice. Moreover, any methodology is acceptable if it is intended and implemented as companywide and all people's participation. And, the thought should be shared by all...

—Because, in people, there are persons who have a doubt about the relation of TPM and sales amount recovery. Moreover, in people, there are persons who have the doubt about the relation of TPM and profit recovery targeted. And finally, in people, there are persons who think this companywide activity to be unsuccessful —I conclude.

—Sir —One of the directors exclaim— I'm sales department manager. Still I'm not clear. Initially I thought that this companywide activity doesn't related to my department. Because —he doubted just a little—, I believed that TPM is just factory matter and not related to us. Please let me know what the relation is and what the job role as sales department is.

— Please, —meanwhile I shown an embarrassed face and, I repeated—. Please, let me finish the theme of "What is the job role of special project?"...

—Anyway, I think many persons have the doubts and concerns about the use of TPM as companywide activity for the goals. So, the job role of this special project is to investigate from the scratch start and identify the necessary activity...

—They, the special project members, might have the doubts. So, **final goals which are profit recovery, sales amount and managerial level improvement should be fixed and never be changed.** And their tasks are

- a) Choosing suitable methods which should be companywide activity.
- b) Investigating the current and past status to identify above a) in considering future prospect.
- c) Making up the action plan including individual items goals.

—Now I ask you —I said looking at the top managements and directors—. Please obey their suggestions. I think it is difficult for you to obey their suggestions if the contents deny your choice of TPM introduction. Because you have your face and you don't want lose your face. But please obey —I suggested and continued...

—You have told me that TPM introduction as companywide activity was agreed by all with no doubt and objection. Am I right? —I asked obviously figuratively—. A person told me that the idea was decided just one top management. Is it true?

—Yes —Directors assumed—. The chairman discussed with a consultant who is his friend and recommended TPM introduction. Then all directors agreed to this idea. And we studied TPM deeply in a book.

—I think the choice of companywide TPM activity was good as the result —I agreed—. However, —I doubt—, however... Had nobody different opinion or ideas? —I asked them.

—In here 9 top managers there. And again, no body? ... In Japan there is a proverb as next.

“The plan which is agreed by all is risky.

The plan which is agreed by all is doubtful”.

“Agree with the world with disagreement”

When writing TPM Jishu-Hozen, a newspaper's column caught my attention. The title is above. And this column introduced an episode of US Upper and Lower Houses.

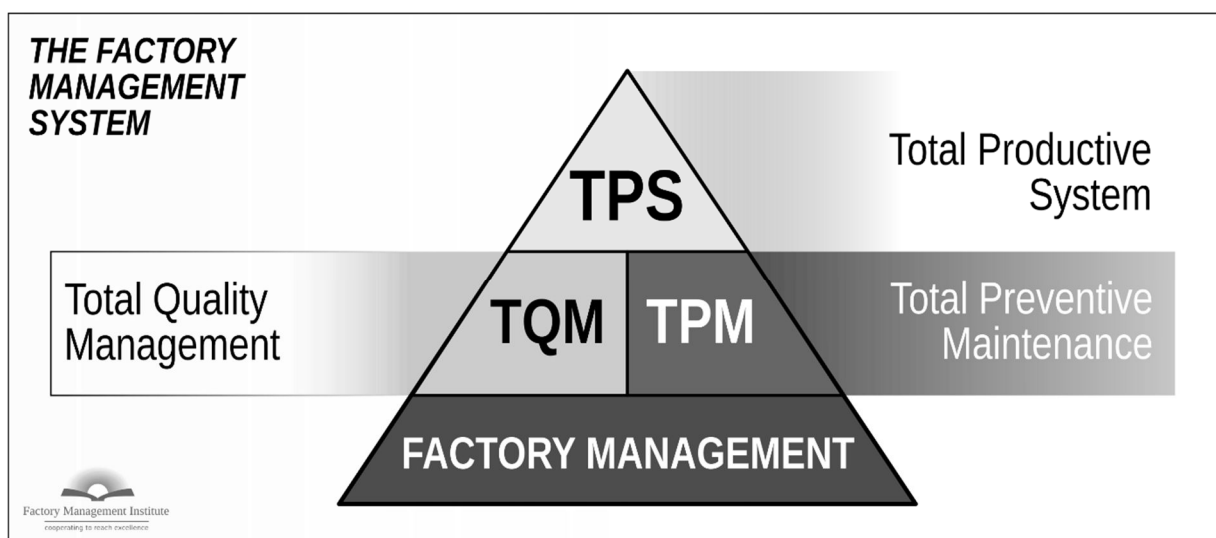
“Immediately after the simultaneous terrorist attacks of the US Central, the US Congress adopted a resolution giving the president the power to practice retaliatory war almost freehand. Although it was quite violent contents, the Senate agreed with all, and the House of Representatives agreed with 420 in favour and one against”.

And is Barbara Lee member who cast the only negative vote.

She said:

I could not agree the resolution like a blank power of attorney.”

It seems that one of her votes saved the United States' danger of falling into "a world without opposition". A society that respects such opposition is important. Even though an opposite opinion is a few, the custom or behaviour of respecting it can support the healthy democracy.



Diversity of opinion

This company decided to implement companywide TPM activity. But when hearing the process of this decision making, I felt uneasy which even top management members might not share the sense of value about the process of achieving goals.

This family-owned company decided TPM introduction as a main pillar of achieving goals.

I think the choice of TPM wasn't bad as the companywide activity. But unfortunately, there wasn't the deepening of discussion (I felt).

Why a diversity of opinion is important? ...There are 3 reasons.

- a. Looking things in multifaceted and
- b. Deepening the thinking
- c. To prevent a losing flexibility of organization

"Looking things in multifaceted" is important to avoid a biased thinking. Now the age is AI and ICT. And the world becoming smaller and quicker change. Especially losing flexibility of organization is serious.

In such world, biased or ignorant thinking is quite risky and unsound for an organization. And such organization will not carry on the function.

Going back to my lecture to this company...

—You agreed to establish the committee in Gembas, Management team and Special project. Then please obey the opinion of Special project team when they make and show the direction for the final goal. And, please listen their survey and suggestion and discuss with them —I conclude.

Meanwhile Mr. S who was the Director and Sales department manager said —You told me as next: "Initially I thought that this companywide activity doesn't related to my department. Because I believed that TPM is just factory matter and not related to us."

—And —I replied—, your question was "what the relation is and what the job role as sales department is". —and I answered— Basically, you should listen and discuss with the Special project team members. But in short, I tell you next:



—In TPM introduction I lead to introduce the system of "Initial Products Quality Control"

—You already learned in a TPM book and know the 12 steps. And, I told you to start the introduction and implementation at same time and at once —I concluded.

—Mr. S. —I pointed out—, your team efforts to gain new orders. And when getting new order, it is the chance of "8. Establish Development & Management system of Products and Equipment". And, we establish a project team in current organization...

—This project is constituted of Sales, Engineering (R & D, Design and Production, Prototype, Maintenance), Production planning, Subcontract management, Quality, Accountant, HR, Material procurement and Factory —and I continued...

—And the activity contents are: Sales forecast, Customer's needs, Cost (Actual, Estimated & Target), Production process designing (Layout, Man-Machine), Production planning, Outsourcing, Quality

actual & Quality target, Labour efficiency target, Scrap ratio, Cost reduction in VA/VE, Machine performance and Safety...

—When getting the opportunity of new products introduction, it is required to make **such Initial Products Quality Control**. And, the chairperson (leader) is chosen from Quality Department traditionally. Then, even Sales department, you are required to attend this companywide activity.

—Sir —the directors replied—. Recently we don't have the opportunity of new products introduction. How can we do?

—Mr. S. —I asked then— What is your opinion? So, they have the concern of no opportunities. What can you do as Sales?

—Of course — Mr. S replied—, we effort to gain new product order and we are doing. But... —he doubted just a few seconds.

—Unfortunately, the efforts of Sales department don't come to fruition —the directors said and, it was forwarded with some other explanations those are not worthy to transcribe now...

—OK —I replied—. Please stop...

Listen the customer's needs

—I would suggest you for "8. Establish Development & Management system of Products and Equipment" and make clear the task of Sales department in this companywide activity.

1) Listen the customer's needs.

—I know —I continued— you are already doing it. But, please do it in your Gembas. You invite customers and let them look our (this company's) production process. Please decide the target date with committee members and project team...

—Up to the target date the Kaizen committee needs to start and gain some result of 5Ss condition, Safety condition and Jishu-Hozen implementation visibly. Therefore, the target date must not tomorrow.



—Listen —I requested—. Do you know who the best sales person is? ...The best person is the production Gemba people.

—Making these tactics, you gain 2 effects —I detailed:

- a) One is of course it is possible to use the opportunity for sales expansion. And;
- b) Another one is to use this for good stimulation for Gembas.

—Improve 5Ss condition —I pointed out— and, before make the customer visiting, do special activity in Gemba. Then the special activity becomes natural capacity. A customer visit can be a good opportunity of coming up.

And please — I asked them—, make some presentations about: TPM companywide activity (Target as TPM, current status and road map), Quality status (Customer's concern, Process quality and target). The purpose of inviting customers is to put to ally.

—I'm afraid —one of the directors replied— Is it not the reverse effect rather? ...If we couldn't improve till to the customer visit, we might have a damage in sales and trust relationship.

—Everyone again —I replied— 3 things:

- a) Implementing this tactic, prepare the sufficient time and never make unreasonable.
- b) Please highlight your future capability.
- c) Provide the opportunity of Gemba presentation by people.

—Anyway, Sales department make such opportunities —I conclude.

—We understood and promise to consider your suggestion —directors agreed—. But still we have a doubt. Probably we could gain new product future. However, we cannot wait till to such unknown timing. Till to gain new product, how can we do?

—I suggest to do same activity with current product —I replied—.

—Yes, we do the activity of "Initial Products Quality Control" with current products for the"8. Establish Development & Management system of Products and Equipment" —Directors agreed.

—Probably —then I suggested— I can gain your understanding when considering "Chasing easy-to-make products and easy-to-use equipment", a reasonable way to consider it is to nominate a current product as a model...

—In SUMITOMO there is a term which is "HINSHITSU-TANAOROSHI" of current products.

- HINSHITSU; Quality.
- TANAOROSHI; Stocktaking.

—The name of HINSHITSU-TANAOROSHI is quite unique and strange —I explained then—. Quality Stocktake? It is indeed strange name. However, reviewing current quality status against the quality goal or ideal status is important...

—Actually, this system is used for just "quality matter" in Sumitomo. However, I wish to use this system as "Initial Products Quality Control" for current products.

Regarding HINSHITSU-TANAOROSHI and Initial Products Quality Control, I will describe these when I describe TQM.

—And —I explain deeply—, choosing one product and we do same activity of "Initial Product Quality Control and re-establish the "Chasing easy-to-make products and easy-to-use equipment"...

—Everyone —I require their attention again—, please understand. You prefer the contents of 12 steps (or 8 pillars). But in the items of 12 steps there is no relation of order, as I said before...

—You have already the organization. Each department is required to participate to this companywide activity. Therefore, each department which even Sales or administration departments such Accountancy, HR also is required to make action plan. And —I detailed—, these action planes are gathered to the Special project team and summarize as the total plan...

—You like 12 steps —I assumed in this case their point of view—. It is acceptable. If so, based on it, you plan individually. And, when planning you need to identify the effects to the goals with figures. So, the figures are required the scientific confirmation.

—I saw your old action plans. Unfortunately, these are just wish list or effort targets. And nobody takes the responsibility —I said.

—Anyway —I asked them—, everyone please decide by yourself. So, you mentioned the concern of failure of customer visit. But... Sales department —I pointed to him—. You invite customers to visit our production Gemba. But before inviting, please discuss with Gembas, committee and the special project team to decide the target date and plan thoroughly...

—And, let us use the customer's visits to enlist as the supporter of our activity —I conclude.

—We have had the customers visits —Directors said—. But it is first time asking customers to visit us with a specific theme. Therefore, a strict preparation is necessary. If not, we might have a bad influence. But is there the necessity? —they doubted again.

—If you have a concern, you don't need to do it. You can decide anything —I replied and I asked to the Sales manager—. What is your opinion?

—I think —Mr. S. answered all Directors and me—, it is quite good idea to use a customer visit for progressing activity. And, I will provide the opportunity to discuss a future business in our production Gembas with current and new customers positively. But —he doubt—, I also have concerns about the status of Gembas. We invite customers to show our TPM activity. —after a pause he asked then— In how level, can we invite customers successfully?

—I say very frankly that in current status which poor 5Ss, Quality, Scrap, Visibility, machine stopping, etc. —I recognize—. You will not be able to gain customer's satisfaction and loose the customer orders. But, In how level? —I asked figuratively.

TPM Checklist

—You check your TPM level in my checklist (In TPM-3, I introduced my checklists⁸). So, this checklist has 80 questions in 8 categories.

1. **As the result; 12 questions.**
2. **Machinery condition; 22 questions.**
3. **Factory management; 11.**
4. **Preventive maintenance in Factory management; 10.**
5. **Standardization in Factory management; 5.**
6. **Factory environment in Factory management; 4.**
7. **Education & training in Factory management; 5. And,**
8. **Operator capacity; 11.**

The checking items are the points of improvement. Therefore, I recommend to make improvement activity based on this checking items.

And after several interventions from the Directors, Mr. S. asked —Probably it is necessary so long days for inviting customers.

⁸ TPM Checklist: <https://archive.org/details/TPM3TPMChecklistSpanishEnglish> & TMP-3: <https://archive.org/details/TPM3PreventiveMaintenance> <https://archive.org/details/TPM3MantenimientoPreventivo>

—I say that not inviting customer till to some level achieved —I replied—. Disclose the current status and the goal and action plan. And, Improve 5Ss and Safety status as the base...



—Let Gemba people make some presentation with small improvement —I continued—. Probably you can gain favourable impression by customers. Anyway, you decide by yourself.

—When comparing to other companies, is our level so low? —Asked the Directors—. And is there other simpler Benchmarking tool?

—Honestly —I recognize—, I say that I don't know. Because I cannot have the opportunity to diagnose with objective checklist. Of course, I have diagnosed many companies who were my clients and had the necessities to improve like as your company. Therefore, their level was same to you —And I continued...

—Other Benchmarking checklist —I wanted to give more feedback—. You like the way of JIPM (Japan Institute of Plant Maintenance) such 8 pillars, 12 steps, do you? ...Then I introduce you a checklist which JIPM uses for the diagnosis and is easier than mine. And, attached checklist is used for TPM Challenge Award Examination (2016).

TPM Checklist by JIPM 2016				
Items		Checkpoints		
1	Clarification of Target figure	1	TPM Policy and Goals (aims) are clarified, deployed in each department, and explained to everyone.	
		2	Policies and targets are caught in PQCDsME.	
		3	It is structured so that activity situation can be known to everyone on the activity board.	
		4	Activities are conducted by overlapping small groups and are deployed with participation by all members.	
		5	The policies and target achievement situation made visible to anyone.	
2	Individual Kaizen	1	The main loss benchmark (BM) that hinders production is grasped.	
		2	Loss reduction activity is made visible to everyone.	
		3	The grasped, main loss is taken up as an improvement theme.	
		4	Improvement methods and procedures have been successfully utilized and the improvement level has improved.	
		5	In reducing the loss, the results and effects before and after the improvement are grasped, and pawns and horizontal development have been done.	
3	Jishu-Hozen	1	To conduct activities in a step manner and to have set targets for each step.	
		2	It has been done Seiri and Seiton of the entire workplace, equipment, tools and materials, and ingenuity of visual control has been done.	
		3	Putting Card activity is performed vigorously and the progress status is known.	
		4	5S and Seiso, inspection, refuelling, retightening, etc. are carried out and maintenance activities are established.	
		5	Diagnosis is performed step by step; progress has become visible in the activity board.	

4	Education and Training	1	Education and training needs are clarified.
		2	An effective educational system and necessary skills for stratification, operation, maintenance and improvement for work are clarified.
		3	Regarding the past Hiyari/Hatto, labor accident, accident, the causes were pursued and countermeasures against reoccurrence have been taken.
		4	It meets legal standards such as wastewater treatment, prevention of air pollution, noise prevention and is managed.
		5	Working on reducing waste and recycling resources.
5	Overall effect	1	To have attained the initial (target figure) with respect to indicators such as the number of breakdowns, the defect rate, the number of complains, the delivery date, inventory, overall efficiency and productivity.
		2	Off from work accidents, accidents, pollution continue to zero.
		3	There is a suggestion scheme, kaizen suggestions have been carried out actively, achieving the target.
		4	Employee motivation to work and PM activities have become stablished and the workplace environment has been improved.
		5	To have concrete action plans for future theme.

—As you understand this checklist has 30 questions in 6 categories: PQCDSE: P; Productivity. Q; Quality. C; Cost. D; Delivery. S; Safety. M; Moral. And. E; Environment.

Hiyari/Hatto: Hiyari and Hatto are the Japanese Mimetic words.

- **Hiyari;** Encountering a dangerous accident and noticing. But before accident.
- **Hatto;** Noticing suddenly in the mind (before occurring an accident).

—Now I introduce the JIPM checklist of Challenge Award. And, JIPE provides other awards which are TPM World Class Award, Advanced Special Award, Special Award, Excellent Category Awards and Continuation Award...

—And each award has the checklist —I explained them—. However, to introduce other checklists is no meaning for you, because you are still the start of challenger level. Anyway, if you wish to understand your level as a Bench Marking, to use the JIPM's Checklist is not bad idea...

—But I recommend stubbornly to use my checklist which intends to identify the concrete improvement points —I conclude.

—Now —I started a new issue—. Everyone you need to understand that if you have a certain level management base and a certain level Gemba, you can introduce TPM (even TPS) by yourself with just reading TPM book. Of course, you don't need me as a consultant.

—Only reading and self-study of TPM is enough for such company, having sufficient management base and Gemba. But —I had to recognize—, a company who has no firm factory management system such your company needs the support of consultancy and is not enough just reading and knowledge of TPM book which generally just shows the goal and the importance and doesn't explain the necessary factory management base and the path and a concrete method of introduction and stability.

—Then, I stop my lecture of today. And, let's do the review of today's lecture —I tried to give them some kind of conclusion explaining what TPM is as next...

What TPM means?



What TPM (Total Preventive Maintenance) is?

Total Preventive Maintenance is to realize the productive factory management with through machine management.



What the meaning of "Total" is?

To realize the productive factory management with through machine management, it is required the all departments, all people's participation.



Flying notes by sensei Kimura

Total Productive Maintenance and Total Productive Management.

These are also so called TPM. And, there were questions about these. So, I say these are just a kind of word game.

If I dare to say:

- Total "Productive" Maintenance is the goal status of Total "Preventive" Maintenance.
- Total "Productive" Management is the goal status of factory management.

When looking the history of JIPM, this institute advocated "PM by all people's participation" at 1971.

And there is no words of Total Productive Maintenance and Total Productive Management in his history.

Therefore, I say that these are just a word games by JIPM and are no meaning.



What the all departments participation is?

Not only the direct departments (such factory, engineering, production planning, material control and sales), but also administrative departments (such Human resources, Accountancy and General Affairs etc.) which departments are required to support above Gembas are required to participate to the companywide activity.

What the establishment of management team is.



It is necessary to maintain the companywide activity and the base of company management.

What the committee establishment is.



It is necessary to establish and stabilize the necessary condition of "**all people's participation**".

—Next lecture—I advise to the Directors—, I would teach you the establishment of Special project team and committee establishment in detail.

—And please consider the establishment of Management team, Special project and Committee by next week and by yourself. And next week, I continue the lecture to this company and discuss the establishment of Special team and Committee.

X. Next Lecture

With this description, I finish the theme of Maintenance Seiso. And.

I would describe about "Prevention of scattering" and above Special team and Committee establishment in Jishu-Hozen.

Koichi Kimura CC4 – May-2019.